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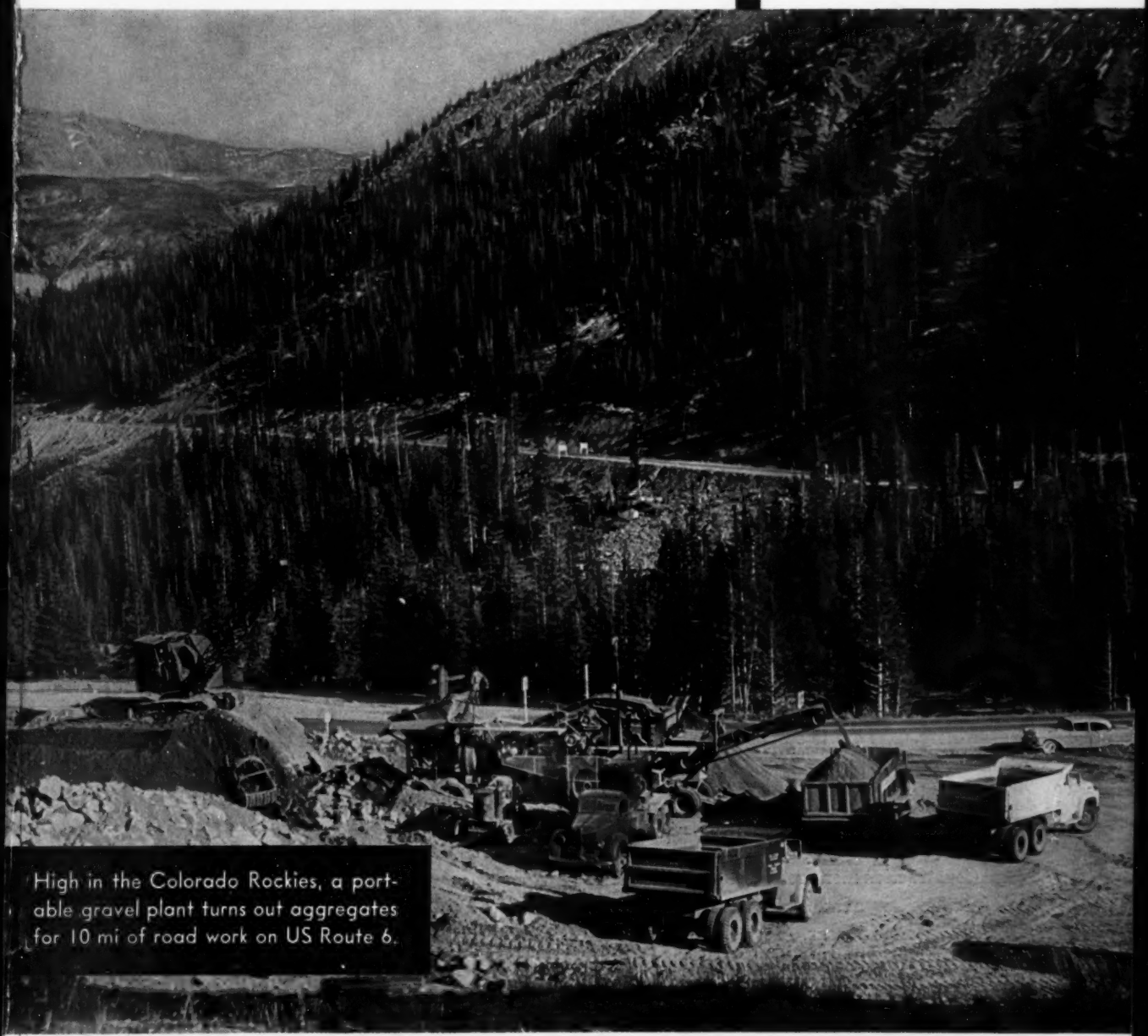
Construction Methods AND EQUIPMENT

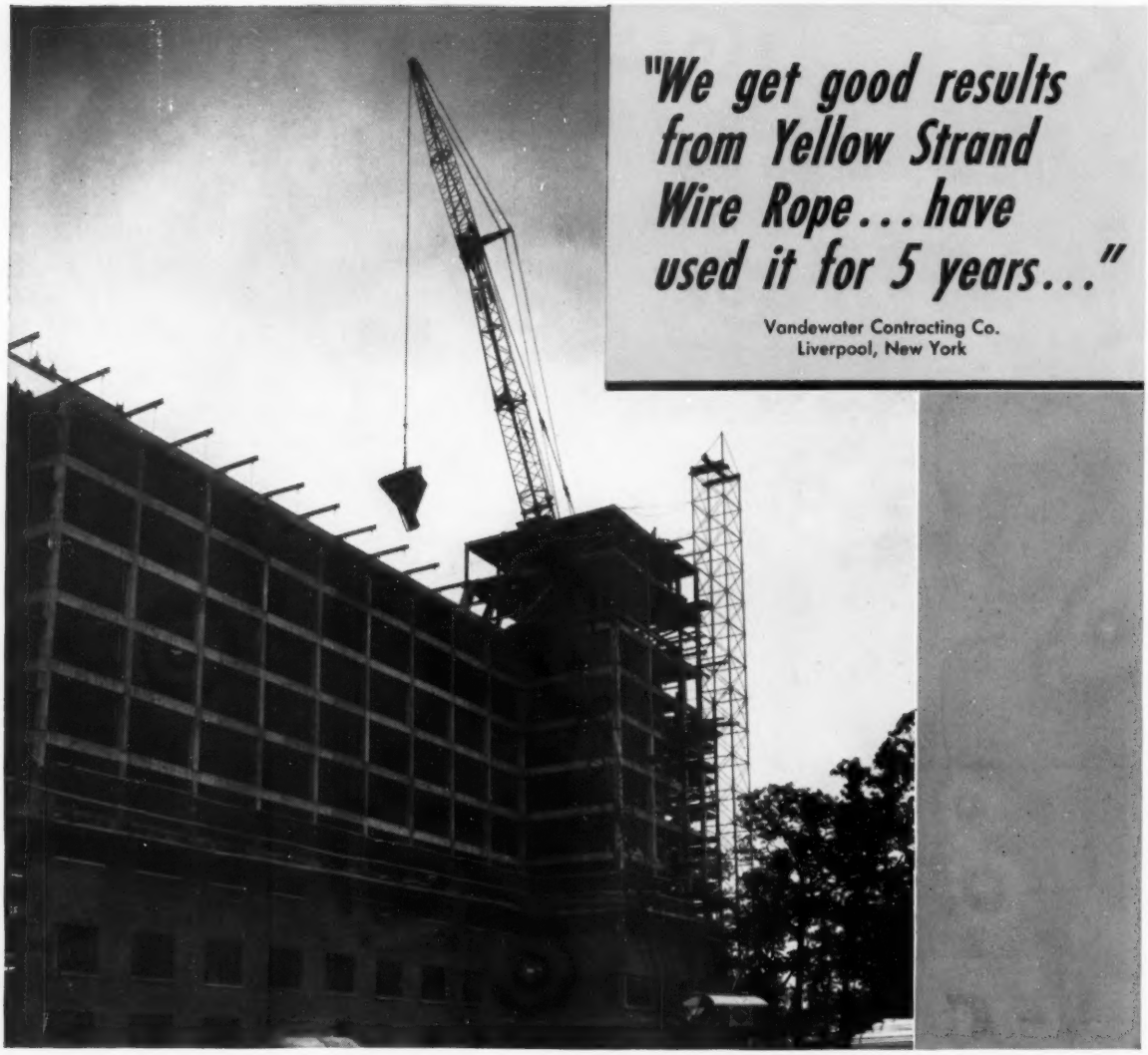
A McGRAW-HILL PUBLICATION

APRIL, 1958



High in the Colorado Rockies, a portable gravel plant turns out aggregates for 10 mi of road work on US Route 6.

CONTENTS, PAGE 4



"We get good results from Yellow Strand Wire Rope... have used it for 5 years..."

Vandewater Contracting Co.
Liverpool, New York

One of Vandewater's cranes is shown lifting a skip of concrete to complete pouring on the new $3,000,000 women's dormitory at Syracuse University, Syracuse, New York.

1″ non-spinning Yellow Strand is used on the skip line and ⅞″ and ¾″ Yellow Strand is used elsewhere. The crane carries a 145′ boom and loads on this job go up to 15,000 lb.

President of the firm, Wm. J. Vandewater, says, "We have used Broderick & Bascom Wire Rope for the past five years with good results."

Construction men prefer Yellow Strand Wire Ropes for many reasons. They're tough, strong and resistant to wear. A type is available for every use, including Flattened Strand and Extra High Strength Yellow Strand "POWER-STEEL." All B & B Wire Ropes are tops for quality materials and precision manufacture. Another big, important advantage: Wherever your job, Yellow Strand is always near at hand. Your B & B Distributor will help you select the right wire rope for your equipment. Call him today for his expert service. Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.

Yellow Strand®
Wire Rope

B.F.Goodrich

B.F.Goodrich tires give up to 50% more service, contractor reports

F. R. HEWETT CO., general contractor of Spokane, Washington, operates 147 pieces of equipment on jobs throughout the Pacific Northwest. Here the job is the Spokane Valley Freeway. "We switched to B.F.Goodrich FLEX-RITE NYLON Rock Logger tires 3 years ago," writes Truck Supt. Richard M. Ward. "They have given us up to 50% more service than the tires we used previously—and we have been able to retread them too!" Today Hewett uses B.F.Goodrich tires 100%.

Reports like this come in from contractors all over the country. They find B.F.Goodrich off-the-road tires give them longer, trouble-free service, thanks in part to FLEX-RITE NYLON cord construction. FLEX-RITE NYLON withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. Result: the FLEX-RITE NYLON cord body outwears even extra-thick B.F.Goodrich treads —can be retreaded over and over.

Follow the lead of contractors like Hewett, who reports B.F.Goodrich tires give "very low cost per hour." See your B.F.Goodrich dealer today. He's listed under Tires in the Yellow Pages of your phone book. And ask about the new Rock Service Tubeless or conventional tire that prevents unnecessary tire failures! *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

B.F.Goodrich truck tires

TWIN FACTS

a report on the cost-cutting performance of Euclid "Twins"

"In 20 years . . . have never seen such a large concentration of adverse materials."

This comment by Acting Resident Engineer Carl B. Johnson describes the working conditions that confront McDowell & McDowell of Nashville, Tennessee, general contractors for the Jackson Lock and Dam project in Alabama. Excavation for a 600′ long lock and fill for an access road 1½ miles away is a 1,100,000 yard job. The material, a conglomeration of saturated clay, silt and sand, makes high production dirt-moving nearly impossible. In addition, there are adverse grades of 20% and 25% on the spongy haul road from excavation site to the access road fill.

McDowell's scraper fleet includes both overhung and six-wheel type single engine scrapers as well as a 24-yd. Euclid "Twin". While the other scrapers were slowed down by the adverse conditions and always required a pusher — sometimes two — to get out of the pit, the "Twin" made it alone most of the time. This advantage helped the Twin-Power "Euc" move 1000 yards a day . . . 30% more payloads than a single engine rig.

On tough jobs such as this or on average work, on long hauls or short hauls, "Twins" are moving the cheapest dirt. For your next bid have a Euclid dealer give you facts and figures on "Twins", your best equipment investment.

EUCLID DIVISION, General Motors Corp., Cleveland 17, O.

Construction Methods AND EQUIPMENT

APRIL, 1958

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ONE OF A SERIES of advertisements to help the construction industry get better service from wire rope.

SHOVEL Chain, Electric, or Steam Crowd
1, 2, 3, Part or Twin Main Hoist Line

DIPPER LATCH LINE

6 x 36G PREformed Regular Lay Whyte Strand Fiber Core
8 x 19E PREformed Regular Lay Whyte Strand Fiber Core
7 x 19 PREformed Aircraft Cord sizes under ¼"

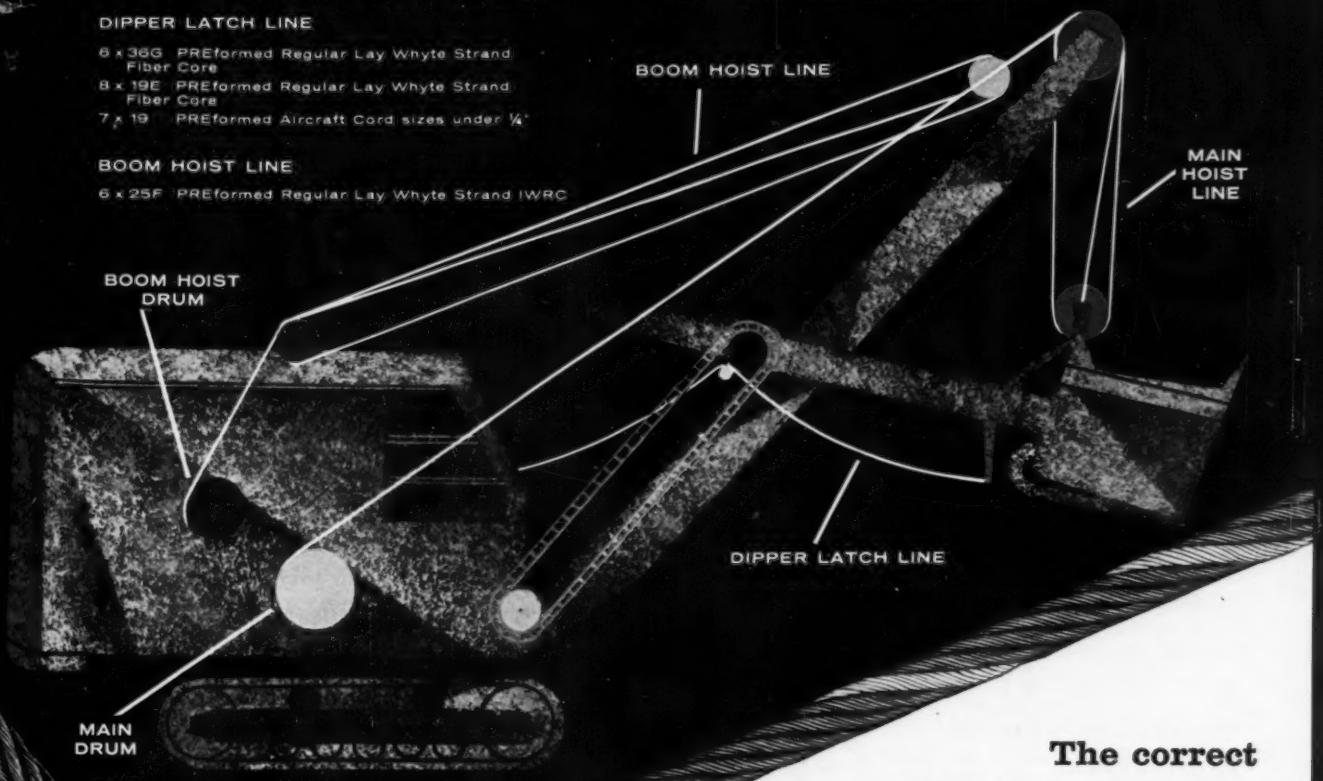
BOOM HOIST LINE

6 x 25F PREformed Regular Lay Whyte Strand IWRC

MAIN HOIST LINE

⅛" and ¾"	6 x 25F	PREformed Lang Lay Whyte Strand IWRC
	6 x 25F	PREformed Regular Lay Whyte Strand IWRC
⅞" and Larger	6 x 25F	PREformed Lang Lay Whyte Strand IWRC
*1" and Larger	6 x 41F	PREformed Lang Lay Whyte Strand IWRC

*Where sheaves or drum diameters are less than 22 times rope diameter.



The correct Macwhyte wire rope will lower your yearly rope costs

You will make substantial savings in the amount of money you spend every year on wire rope for shovels — or any other equipment — if you use the right *type* of rope designed for your job.

Shown above are correct recommended wire ropes for use as main hoist line, dipper latch line, and boom hoist line on power-shovels. Each of the Macwhyte wire ropes listed is designed to shrug off the normal abuse, strain, and abrasion encountered in shovel service, and to offer exceptional service life.

Whyte Strand wire ropes are PREformed to eliminate any internal stresses in manufacture. This is particularly important in shovel service, where rough use and reverse bends subject *any* wire rope to severe flexing and bending strains as it curves around sheaves and drums.

In addition, every inch of Whyte Strand wire rope is internally lubricated. As the rope flexes, this enables adjoining wires to move by each other without wear, and extends the life of the rope. The tenacious lubricant also protects the exterior strands against moisture and corrosion.

Reeve up your shovels with Whyte Strand wire rope and watch rope costs drop! 103

INDUSTRIAL • AIRCRAFT • MINING • LOGGING • ELEVATOR • MARINE • CONSTRUCTION • DRILLING

MACWHYTE Wire Rope COMPANY

MACWHYTE WIRE ROPE COMPANY
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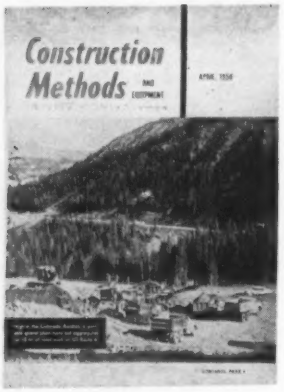


ON THE COVER

Denver's Northwestern Engineering Co. is rebuilding 10 mi of US 6 and adding three 1,000-ft "passing lanes" near Loveland Pass, Colo. To produce aggregates for the $377,777 job, the contractor set up a Cedarapids Commander portable crushing plant at an altitude of 10,200 ft. A Northwest Model 25 dragline feeds the plant, which is powered by International UD-24 engine.

DEPARTMENTS

Construction News From Washington 13
Job Talk 20
Trends in the Machinery Market 41
Construction Business 42
Picture of the Month 57
Construction News in Pictures 61
Construction 'Round the World 68
Editorial 79
McGraw-Hill Editorial 191
Construction Men in the News 195
Sales and Service 196
Construction Equipment News 202
New Publications 244
The Maintenance Shop 251
Methods Memo 258

NEXT MONTH

AASHO's $20-million Test Road Project in Ottawa, Ill., is a precision roadbuilding job. First of two articles in the May issue will describe how contractors meet rigid earthmoving and grading specifications. A later article will describe paving techniques.

APRIL 1958

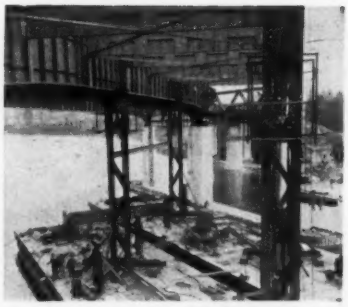
Pay Dirt in This Issue

Big Truck Moves Dirt In 165-Ton Loads 80

Biggest dump truck in the world, a monster with an empty weight of 78.5 tons, hauls heaped loads of 110 yd in tests. It's the creation of Western Contracting Corp.

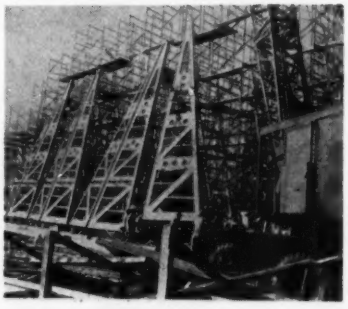
Bridge Girders Ride Tide into Place 88

A steel contractor erected four 135-ton bridge girders by jacking them up on four barge towers, floating them in over the piers, and letting the tide do the rest.



Joints Between Panels Form Frame of Church . . 102

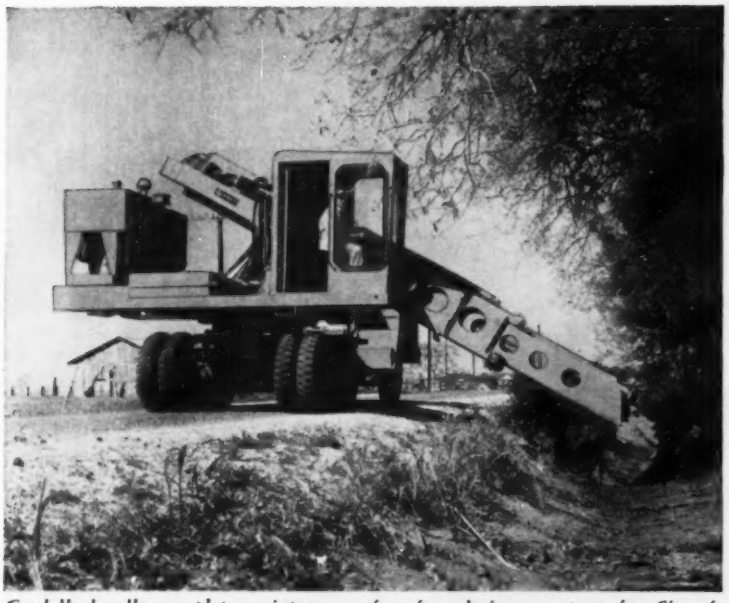
Precast concrete panels — 152 of them — fit together like pieces of a jigsaw puzzle to enclose a church. Joints between the panels form the building's structural frame.



Precast Concrete Frames Cure Overnight 84
Equipment Sparks Bituminous Paving Progress 113
Forms Mould Sculptured Concrete Museum 138
German Crane Invades U.S. 149
Job-Built Pan Molds Median 156
Permanent Bracing Shores Open-Pit Foundation 166
Builder Designs, Erects Bridge 176

TWO GRADALLS SAVE $147,763 ANNUALLY FOR CITY OF PORT ARTHUR, TEXAS

Handle complete surface drainage maintenance



Gradalls handle complete maintenance of surface drainage systems for City of Port Arthur—saving 76,960 man hours a year.

Port Arthur also uses its Gradalls on water and sewer department improvement projects.

HOW MUCH does labor cost? An analysis of your own cost records may be quite revealing—as the City of Port Arthur, Texas, found out recently. After a thorough cost analysis on the maintenance of their surface drainage systems, they discovered the use of their two Gradalls versus hand labor resulted in an annual savings of $147,763!

M. C. Creswell, Port Arthur's Supt. of Public Works, stated, "Prior to the purchase of our two Gradalls, we used 55 men and 8 trucks in an unsuccessful attempt to maintain our surface drainage. Now, with the Gradalls, 18 men and 6 trucks, we do more work and *do it better.* This reduction in manpower —76,960 man hours a year—means a cost savings to us of $147,763 annually. So, it didn't take long for the Gradalls to pay off their cost. It also enabled us to transfer 37 men into undermanned departments."

Recently, Port Arthur put one of their Gradalls full time on a sizable program of improvement projects. As work progressed, it often became necessary to use the second Gradall to keep operations running efficiently and maintain work schedules. So to keep all programs up to date, the City of Port Arthur has just purchased their *third* Gradall.

Why not arrange for a field demonstration with your nearest Gradall Distributor? Let him show how this multi-purpose machine can cut your costs, eliminate costly, time-consuming hand labor and speed job completion.

® Reg. U.S. Pat. Off.

Gradall®
A Product of
WARNER & SWASEY
CLEVELAND 3, OHIO

MANUFACTURERS OF **Gradall, Hopto** EXCAVATORS AND **Duplex** TRUCKS

(Advertisement)

SCREEDING *PLUS* PLANNING SPEEDS FLOOR FINISHING AT NEW I.B.M. OWEGO PLANT

Screeding 2-inch slump concrete with a STOW 25 foot vibrating screed

Two STOW G46 Roto-Trowels follow the screeds to get final finish

OWEGO, N. Y. Crow-Smith, contractors on the new $12,000,000 International Business Machines Corporation plant in Owego, N. Y., engineered the 175,000 sq. ft. manufacturing plant right down to the numbers, types and sizes of paving equipment to be used. Two 25 ft. Stow vibrating screeds were used to strike off the concrete. The floors were laid out in 25 ft. lanes, so that the same screed beam length could be used throughout the plant.

Crow-Smith saved considerable time by using a vibrating screed of this length, both in the actual screeding operation and in putting in the forms.

After screeding the 2-inch slump concrete, Crow-Smith used two Stow 46-inch Roto-Trowels to do the floating and finishing job.

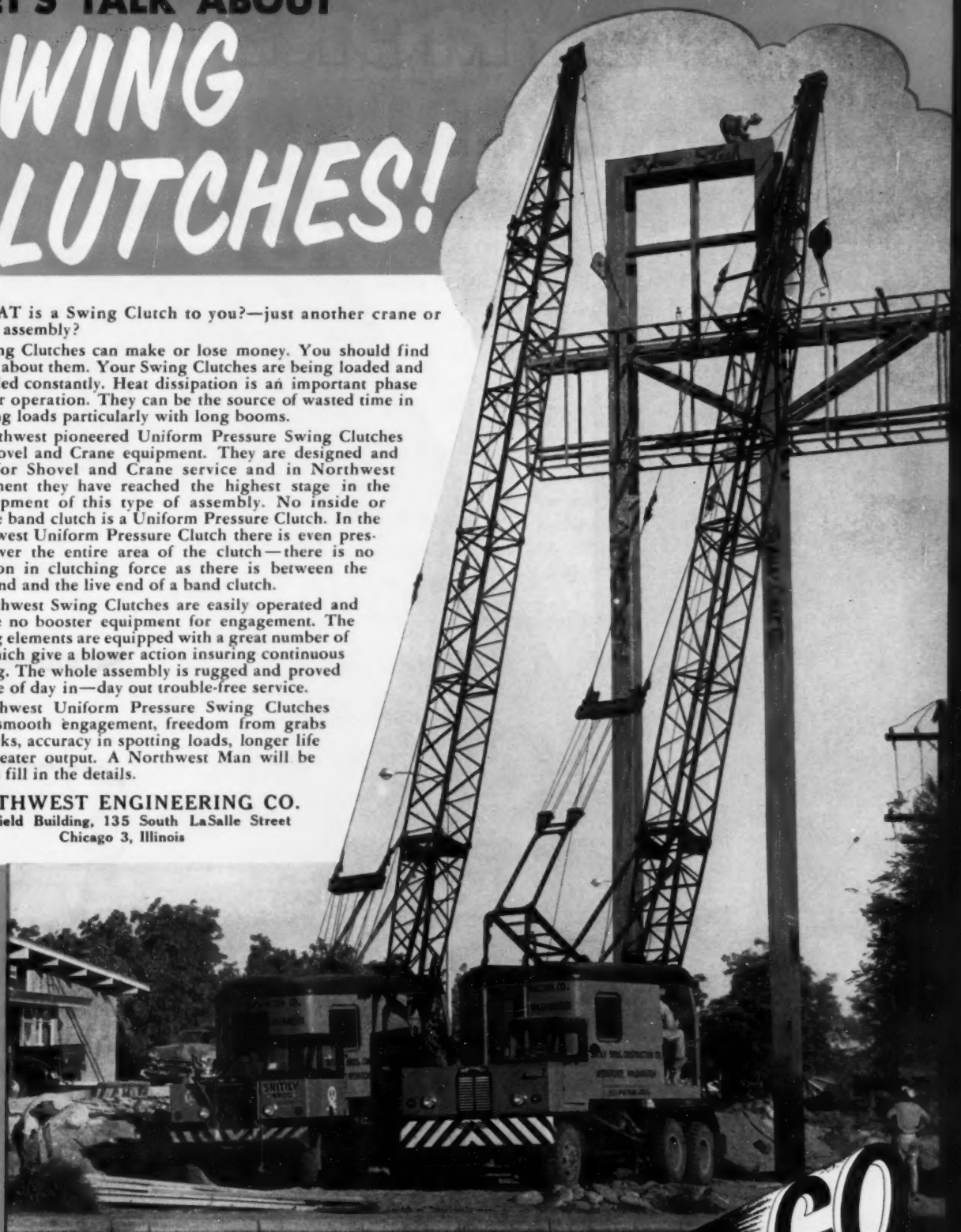
Experience has proved that Stow screeds cut production time almost in half. Also, they strike off *stiff* concrete smooth and true to grade and vibrate it at the same time.

Stow offers quick delivery; screeds can be shipped within three days of receipt of order. Stow screeds are available complete, cut to any desired length, or the Stow package assembly without beam, consisting of 2½ HP vibrating unit, brackets for engine mounting, end rollers, handles and all necessary bolts.

For more information on Stow screeds, write

STOW MANUFACTURING CO. **31 SHEAR ST., BINGHAMTON, N. Y.**

LET'S TALK ABOUT SWING CLUTCHES!



WHAT is a Swing Clutch to you?—just another crane or shovel assembly?

Swing Clutches can make or lose money. You should find out all about them. Your Swing Clutches are being loaded and unloaded constantly. Heat dissipation is an important phase of their operation. They can be the source of wasted time in spotting loads particularly with long booms.

Northwest pioneered Uniform Pressure Swing Clutches for Shovel and Crane equipment. They are designed and built for Shovel and Crane service and in Northwest equipment they have reached the highest stage in the development of this type of assembly. No inside or outside band clutch is a Uniform Pressure Clutch. In the Northwest Uniform Pressure Clutch there is even pressure over the entire area of the clutch—there is no variation in clutching force as there is between the dead end and the live end of a band clutch.

Northwest Swing Clutches are easily operated and require no booster equipment for engagement. The driving elements are equipped with a great number of fins which give a blower action insuring continuous cooling. The whole assembly is rugged and proved capable of day in—day out trouble-free service.

Northwest Uniform Pressure Swing Clutches mean smooth engagement, freedom from grabs and jerks, accuracy in spotting loads, longer life and greater output. A Northwest Man will be glad to fill in the details.

NORTHWEST ENGINEERING CO.
1503 Field Building, 135 South LaSalle Street
Chicago 3, Illinois

NORTHWEST *Always Ready to* GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

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¾ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

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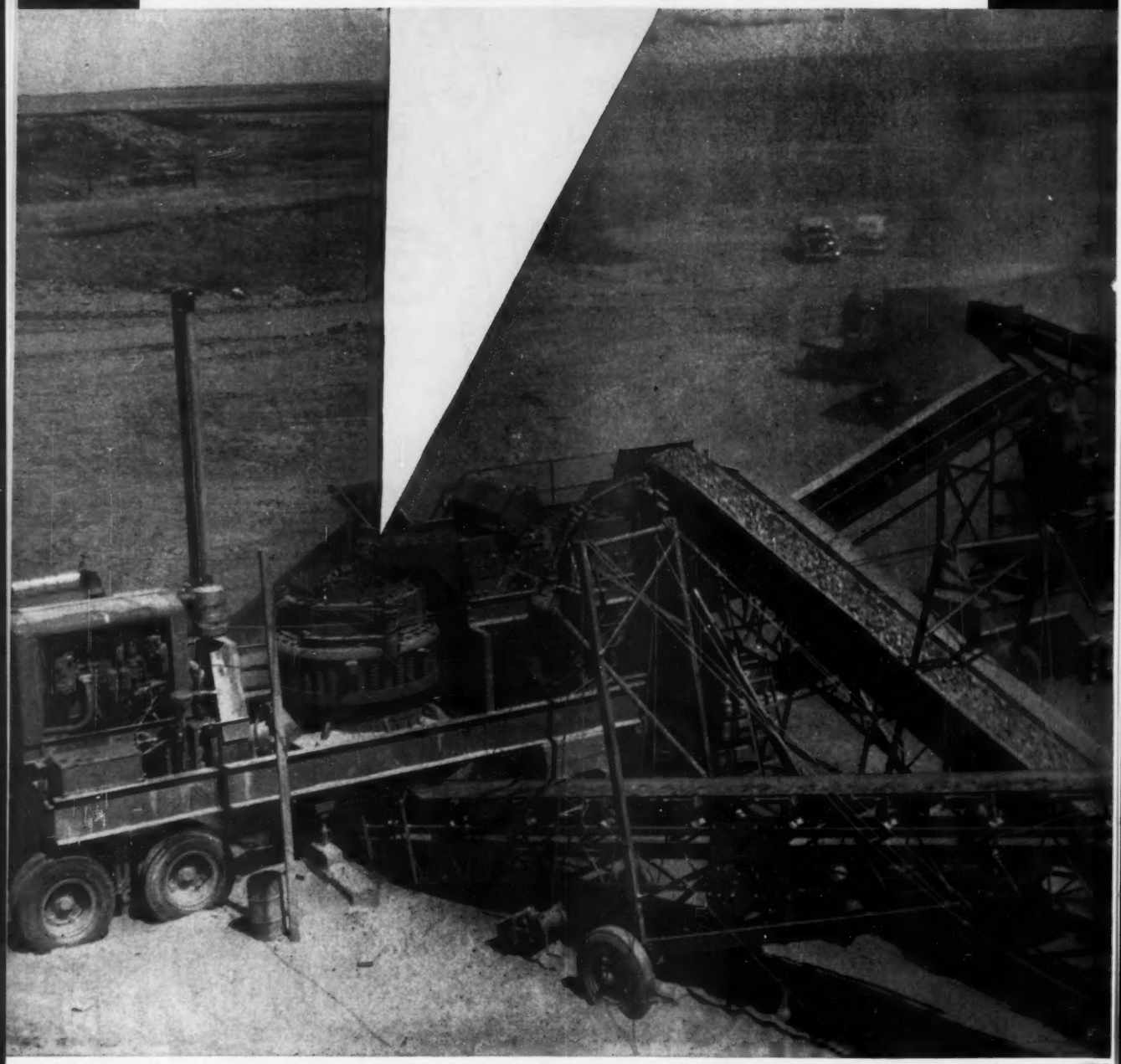
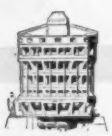
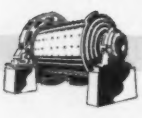
CONE CRUSHERS
in portable plants



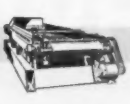


SYMONS PRIMARY GYRATORY CRUSHERS



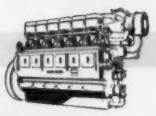
NORDBERG GRINDING MILLS

SYMONS VIBRATING GRIZZLIES



SYMONS VIBRATING SCREENS

NORDBERG KILNS DRYERS, COOLERS



NORDBERG ENGINES

...a Profit-Making Combination for the BIG JOBS ahead

When you combine the proven ability of Symons Cone Crushers to produce big capacity of accurately sized product, together with the complete mobility of a portable plant, you gain many of the advantages of stationary plant operation that you can take right to the job. That's the combination that helps you beat competition and make more money on the big jobs ahead.

Here's where portability pays off—With the plant working close to a big dam project, concrete construction job or airport project, you cut hauling costs and save time. On roadbuilding contracts, the portable-mounted Symons Cone Crusher often can move to the job site, or move from pit to pit to take advantage of better material or more favorable crushing percentages. On bituminous concrete jobs, you can supply specification material to asphalt plants from convenient, near-by locations.

Symons Cone Crushers are known throughout the world for efficient, low-cost performance and high capacities of uniform fine-crushed products . . . and now you can have those profit-boosting advantages on a 100% portable plant. Before you submit your next bid, get full information about Symons Cone Crushers for portable plant service.

(Left): Increasing numbers of portable plant operators are now using Symons Cone Crushers for big capacity of fine product . . . such as this efficient Cedarapids Model 4-ICS portable intermediate crushing plant utilizing a 4' Symons Cone Crusher.

—AND FOR STATIONARY PLANTS

Symons Cone Crushers are the choice of leading producers throughout the world for secondary and finer reductions in all types of ore and mineral processing operations. Available in both Standard and Short Head types, Symons Cones are built in sizes from 22" to 7' in diameter, for capacities of from 6 to 900 or more tons per hour. *Write for literature.*

C357

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MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

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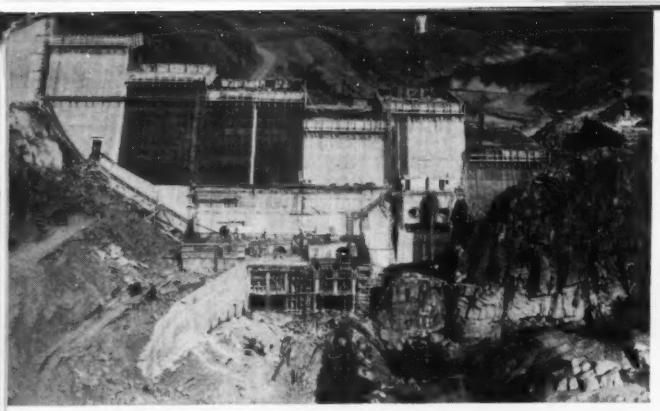
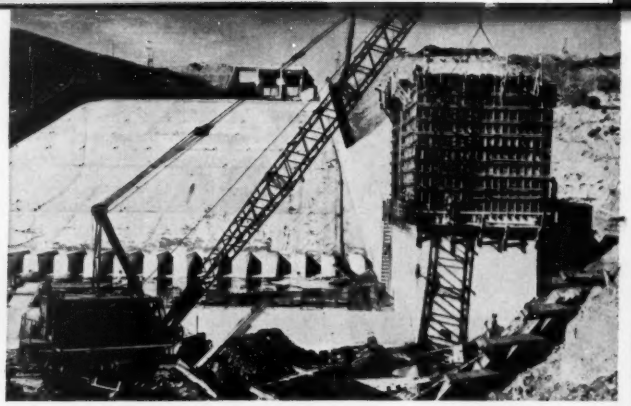
SYMONS . . . *a registered Nordberg trademark known throughout the world.*

NORDBERG MFG., CO.
Milwaukee, Wisconsin



TEXACO PLAN was used from the start in construction of the Tiber Dam on Montana's Marius River. Dam is 205 feet high and 4,300 feet long.



TIME AND CONFUSION SAVED by Texaco Plan kept maintenance costs low during construction of Tulloch Dam in California.

These 5 great American construction projects use **Texaco Simplified Lubrication Plan**

These five projects represent hundreds of millions of dollars in construction costs. When you hit these figures, lubrication can be an especially big item. But on any size job, it's not the cost of the lubricants themselves but the difference between *planned* and haphazard lubrication methods that counts. The latter can cause unexpected breakdowns, costly overtime, and ruined equipment. But planned lubrication can speed project completion, minimize downtime, lengthen equipment life. That's why cost-conscious contractors are turning to Texaco's Simplified Lubrication Plan.

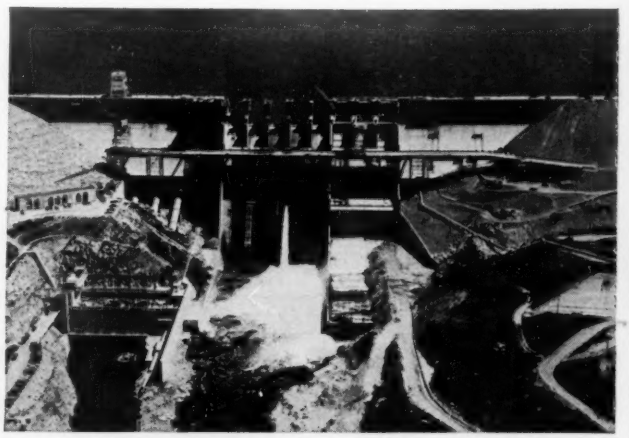
TEXACO PLAN SAVED THOUSANDS OF DOLLARS on these jobs. And it can do the same for you. It cuts the number of lubricants you need for all your major lubrication down to no more than six, and it helps you set up an efficient lubricating system for all your equipment. Furthermore, your Texaco Lubrication Engineer will gear the Texaco Plan to your particular requirements.

GET THE WHOLE STORY. Contact your nearest Texaco Lubrication Engineer *soon*. He can show you how much the Texaco Simplified Lubrication Plan has saved contractors in the past—how it can help you in the future. Just call the nearest of more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

WELL AHEAD OF SCHEDULE, Columbia River's Priest Rapids Dam is already more than one-third complete. Texaco lubricants are used exclusively.



WORLD'S LARGEST earthfill and concrete project, Folsom Dam on the American River, used the Texaco Simplified Lubrication Plan from start to finish.

(Advertisement)

HUNGRY HORSE DAM, MONTANA. TEXACO PLAN PLAYED VITAL PART IN ON-TIME PROJECT COMPLETION.

The Tractors That Contractors Drafted

The NEW JOHN DEERE "440's"

The highly mobile new "440" Wheel Tractor is ideal for construction and maintenance work of all types.

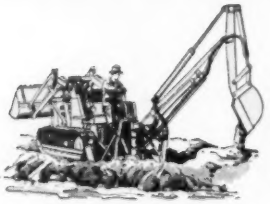
Ruggedness, power, operator's comfort, and all-around economy are featured in the new "440" Crawler.

THE new John Deere Crawler and Wheel Tractors are just what contractors ordered—big-capacity power at low cost—low in initial cost and in operating cost.

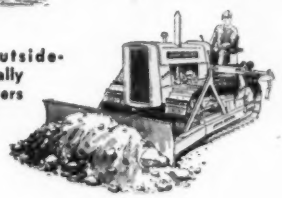
Both John Deere Tractors are ruggedly built from grille to drawbar . . . designed, inside and out, to fill definite needs in construction work of all types . . . to cut costs to rock-bottom on every job you assign them. Both tractors are built around the amazingly efficient John Deere engine, unmatched for delivering so much for so long for so little. Both are ruggedly constructed and boast many features, including optional clutch-type direction reverser, that enable them to do more than their share of the day's work. Power steering on wheel type is available if desired.

Let your John Deere industrial dealer fill you in on the many qualities of design and construction that make these tractors so suitable for the rough, tough everyday jobs of the modern builder and contractor.

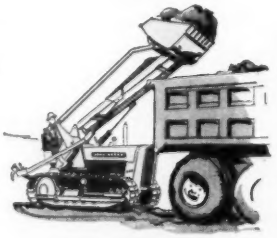
A new, complete line of John Deere quality-built working equipment matches the "440's" to the construction job.



Deep-digging, highly efficient backhoes . . . power-operated trenching units . . . and fast working scrapers are available for both crawler and wheel models.



Inside- and outside-mounted, hydraulically controlled bulldozers team up with the high-torque John Deere Crawler to handle a wide variety of work.



Heavy-duty front-end loaders with rear-end scarifiers make fast work of earth moving. Exclusive clutch-type direction reverser saves time, effort on many jobs.

Your John Deere industrial dealer can tell you of the many other types of equipment available for use with John Deere Industrial Tractors.

JOHN DEERE Industrial Tractors and Equipment

Completely Engineered for Industry

For Further Information Write: **JOHN DEERE INDUSTRIAL DIVISION • MOLINE, ILLINOIS**

Construction News From Washington

Washington, D.C.
April, 1958

Big Jump in Federal Construction

The political impact of unemployment and the business recession guarantees a big permanent boost in federal spending for construction. Bound to be affected are housing, highways, rivers and harbors, flood control, reclamation, federal buildings, sewage treatment works, dams, and national parks.

Military construction—missile bases, airfields, radar detection fences, and the like—is going to go up, too.

Billions are involved. Both the Administration and the Democrats in Congress are boosting the amounts of money to be spent on construction projects already under way. The theory is that this pumps out money more quickly, puts men to work. Between now and June 30, for instance, the Corps of Engineers expects to pump out $70 million more than previously planned.

For fiscal 1959—beginning next July 1—spending programs of the Army Engineers and the Interior Department have been increased by some $200 million. That's $200 million more than Pres. Eisenhower scheduled when he sent his budget to Congress in January.

There's no doubt that the Administration's own proposals for faster public works spending will go up still more. But the Democrats will not be satisfied. Democratic strategists see the recession as their best issue for this fall's elections. They will push hard for more than the Administration proposes.

Tax Cuts Seem Sure, Too

There'll be cuts in taxes across the board—individual income, excise, and corporate income taxes—unless there's a swift upturn in business. In general, the Administration line is that cuts should be voted "if necessary." But most Republicans believe a tax cut is the anti-recession device that will turn the trick. They look upon increased public works construction as good politics and necessary to the long-term expansion of the economy, but they don't believe it's possible to pump out enough money fast enough to be of much help soon.

Housing Moves Ahead First

The Democrats are pushing legislation to boost housing starts. Their emergency legislation is intended to get an additional 200,000 housing starts over the next year or so by putting about $2 billion of additional federal funds into home financing—much of it immediately available to home builders to get projects under way.

Builders of multi-unit projects—military housing, college dormitories, subdivisions—will benefit substantially from this legislation.

continued on next page

A Boost for Roadbuilding

Both the Administration and the Democrats support increases in highway construction. States are sure to get shortly at least $400 million of additional federal funds for non-interstate projects for which contracts can be let this year.

This is being made available under new arrangements that will permit the federal government to pay much more of the total cost than the 50% it normally puts up for these roads. State contracting agencies won't have to look for much additional money.

Interstate network roads will benefit from a change in the trust fund which will allow distribution to state contracting agencies of about $200 million more federal tax money during the year beginning July 1. The increase will be $900 million the following year.

Corps of Engineers Projects

Democrats will keep plugging for more starts and more spending on projects already under way. Pres. Eisenhower has asked for only $125 million to be added to the $520 million for Corps of Engineer construction in the 1959 budget. But the Democrats aren't satisfied with this. In fact, Appropriations Committee Chairman Clarence Cannon sent Corps of Engineer officials away when they came to Congress with a construction program based on the President's budget. Cannon said this was obviously inadequate and that there was no point wasting time with it.

Democrats will go the limit with what the Corps of Engineers has said it could spend on going projects next year and, in addition, will add money for new starts from the $800 million backlog of projects planned to the stage where contracts could be let.

Corps of Engineers total backlog of civil works is $4.7 billion, to which Congress is adding $1.5 billion in a rivers and harbors bill.

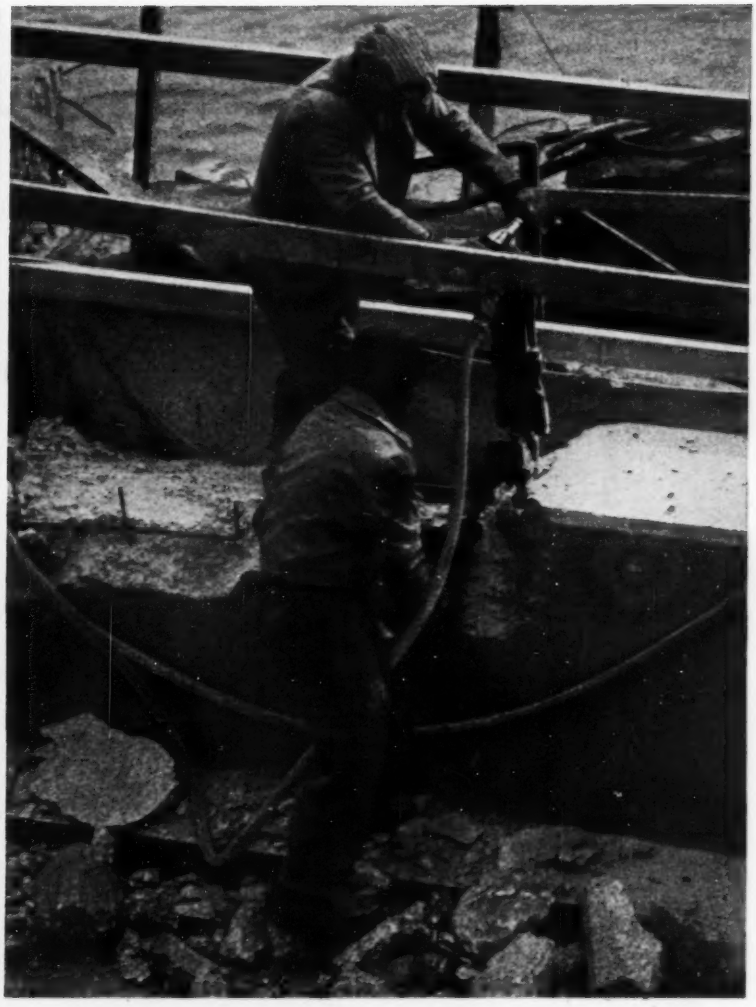
Reclamation, Too

The Bureau of Reclamation already has money to speed up construction of such major projects as Glen Canyon Dam on the Colorado River and the Trinity River Project in California. Pres. Eisenhower now is asking $70 million more for fiscal 1959, on top of the $170 million for construction in his budget. This money would start big dams on the upper Colorado: the $83 million Flaming Gorge Project and the $37 million Navajo Project.

Employment Outlook Good

The outlook for employment in the construction industry is good despite the deepening recession elsewhere. Even though more people than ever are expected to be out of work during March and April, contractors will be adding employees during those months.

The heavy construction industry has been operating at a comparatively high level during the past few months, and the forecast is for greater activity as the spring season gets under way.



GOODYEAR INDUSTRIAL PRODUCTS

GR-Specified

Contractor's Air-Water Hose for Construction Work

A Rugged cover that's both abrasion- and sun-resisting—continuously print-branded for easy identification

B Extra-tough braids of high-tensile rayon cord to handle pressures, resist crushing or kinking

C Special nonporous tube resists alkali or slightly acid water

Now—a hose that's built for builders

Say good-by to the big inventories of both air hose and water hose most big construction jobs always required. Here, in a new kind of hose that handles the jobs of either one – you have the means of wiping out time-eating handling as well as profit-eating costs.

Goodyear and the G.T.M. – Goodyear Technical Man – developed and built this hose just for contractors. As an air hose, it accommodates pressures up to 200 psi. Or, as a water hose, it's ideal for filling, supply and wash-down service. And it's available in continuous lengths up to 500 feet (in the ¾-inch size).

What's more, it gives you the super-toughness any contractor's hose must have. Muscular, high-tensile rayon cord reinforcements handle the high pressures and resist kinking or crushing – yet give you exceptional flexibility for easy handling. And an extra-tough cover resists abrasion, weathering, or any other kind of punishment construction work usually dishes out.

Wouldn't it pay *you* to look into this great new hose? It's one of more than 800 Goodyear hoses designed for every hose job. And they're all available through your Goodyear Distributor—or by writing Goodyear, Industrial Products Division, Akron 16, Ohio.

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

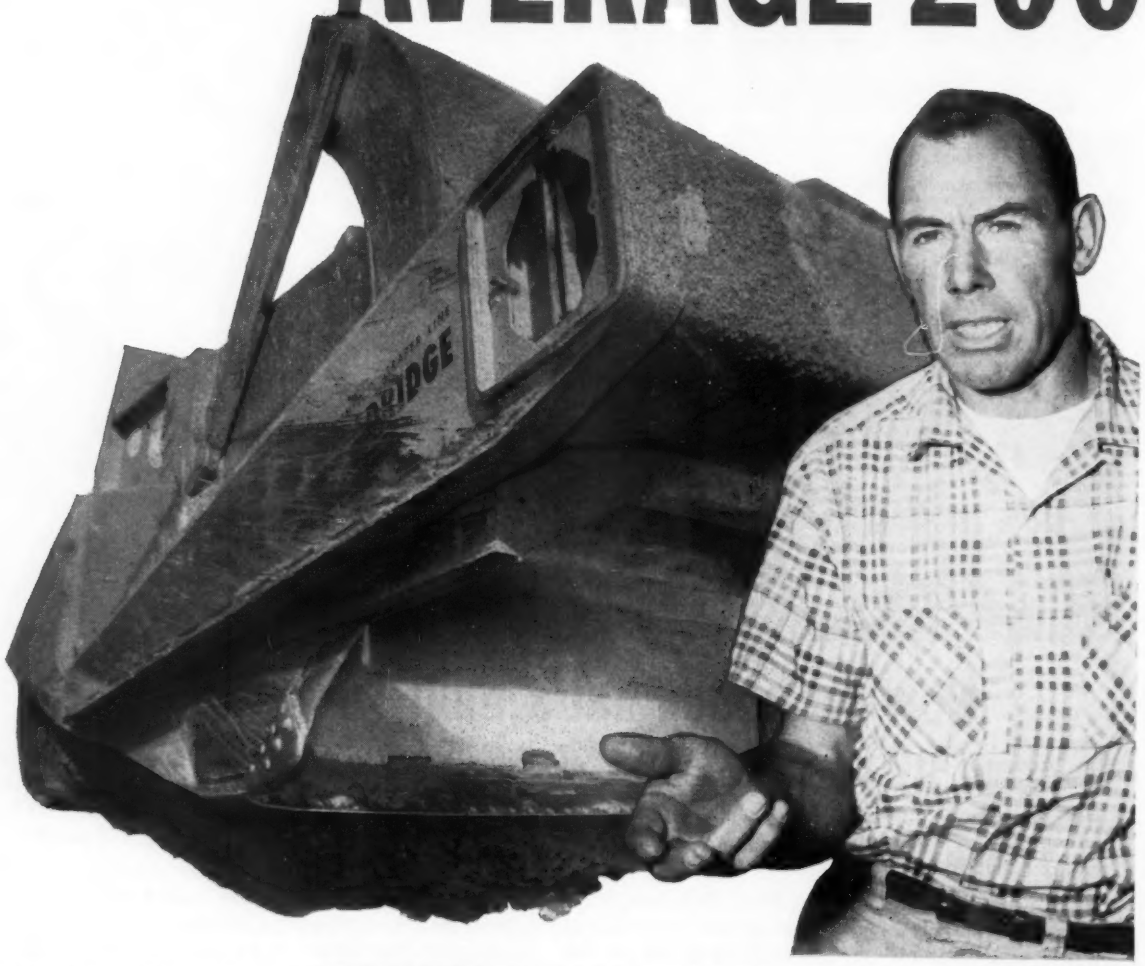
CONTRACTOR'S AIR-WATER HOSE by

GOODYEAR 60th GOODYEAR ANNIVERSARY

THE GREATEST NAME IN RUBBER

ESCO CUTTING EDGES

AVERAGE 200



RICHARD CHAFIN, project engineer of Madonna Construction Company, uses ESCO cutting edges to keep maintenance costs low.

HOURS OF SERVICE
...on each side!

The Madonna Construction Company switched to *ESCO* cutting edges after on-the-job tests that "represented every known strata in southern California." Richard Chafin, project engineer, relied on *ESCO* bits to move 200,000 yards of sandy gravel, studded with 36-inch donickers... and in doing so compiled maintenance figures that showed *ESCO* bits averaging 200 hours before reversing.

Cutting edge longevity is only half the story. Bits that last longer mean less down time, lower charges against machinery idled through frequent bit changes. *ESCO* cutting edges, Chafin found, maintained the 150 cubic yard-per-hour rate that he considers essential if earth moving is to pay.

What *ESCO* products did for this project engineer, they can do for you. Put *ESCO's* durability to work for you. Use *ESCO* cutting edges —they'll save you time, when time is money.

See your nearest ESCO dealer or write direct.

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PROOF!

To Whom It May Concern:

You can be sure of making the wisest investment and obtaining the most productive equipment by inviting leading manufacturers to participate in competitive on-the-job demonstrations with qualified operators.

The demonstration reported here was held last year at my request and I personally kept the records of the times and tonnages in all instances.

The results gave me definite proof of the superior performance of the "PAYLOADER" machine and was the basis for my recommendation for the purchase of this equipment.

Phil Bigham

PHIL BIGHAM
County Engineer
Barton County, Kansas

Independent Tests with Factory-Trained Operators Prove PAYLOADER® Best

You can't make money on manufacturers' claims. It's performance on-the-job that counts. That is why we welcome the opportunity to report the results of independent, unbiased competitive tests such as the one tabled below. "PAYLOADER" tractor-shovels will not only give you greater performance and production . . . they'll PROVE it on your job.

	Run No.	Travel Distance	Model HO PAYLOADER	Machine "A"	Machine "B"
Loading Trucks from Stockpile... Tons per Hour	1	——	432	289	222
	2	——	391	324	254
	3	——	366	311	259
	4	——	358	288	285
Loading Trucks from Windrows... Tons per Hour	5	150 ft.	327	192	207
	6	150 ft.	313	192	178
	7	100 ft.	390	262	240
	8	100 ft.	394	274	253
Overall Average...Tons per Hour			**371**	**267**	**237**

Ask about . . .

PURCHASE AND HOUGH LEASE PLANS

Your Hough Distributor offers the widest choice of financing plans: TIME PAYMENT . . . LEASING PLANS*, with or without OPTION TO PURCHASE — whatever one best fits your needs for the purchase of "PAYLOADER" units. See him today.

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Send more data on 4-wheel-drive "PAYLOADER" tractor-shovels as checked:

- ☐ HO—9,000 lb. carry cap. (1 to 4 cu. yd. buckets)
- ☐ HH—7,000 lb. carry cap. (⅞ to 3½ cu. yd. buckets)
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LABYRINTH® WATERSTOPS

A SOUND INVESTMENT FOR CONCRETE CONSTRUCTION!

LABYRINTH AVAILABLE IN 2, 3 or 4 rib.

ON YOUR CONSTRUCTION:

1. Consider the investment in design, materials and labor (to mention a few).

2. Then consider how important safe, secure *watertight* concrete joints are.

3. Thorough watertightness *can* be secured by installing Labyrinth Waterstops—a dividend that makes the low initial cost of the product insignificant when compared to your total investment—and one that insures watertight concrete joints for years!

- Corrugated ribs grip concrete, insure an everlasting bond between joints.
- Finest polyvinyl plastic resists chemical action, aging, severe weather.
- Takes just seconds to nail to form . . . easy to cut and splice on location (prefabricated fittings available).
- There's a Water Seal product for every type of concrete work!

If your aim is to stop water seepage, *stop it effectively with Water Seals' Waterstops!*

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Job Talk . . .

Mufflecovers Restore Peace in London

When contractor John Mowlen & Co., Ltd., sent a work crew to the south end of Lambeth Bridge in London to break up some 2½-ft-thick concrete paving he didn't reckon with the nearby British Ministry of Works. Workers complained of the undignified loud and rhythmical metallic blows of the jackhammers. Limiting paving breaking to a few morning and evening hours failed to pacify workers in the Ministry of Works. Mowlen put an end to complaints and noise by covering the jackhammers with Thor Power Tool Co.'s Mufflecovers. The Mufflecovers cut 60% of the noise and replaced the harsh metallic sounds with soft thuds.

Whirley Bird Pushes Barge Around

Here's a new use for helicopters. One of New York Trap Rock Corp.'s barges recently slipped its mooring at Haverstraw, N. Y., and drifted across the Hudson River four miles to run aground on the river's east bank. It ap-

continued on page 26

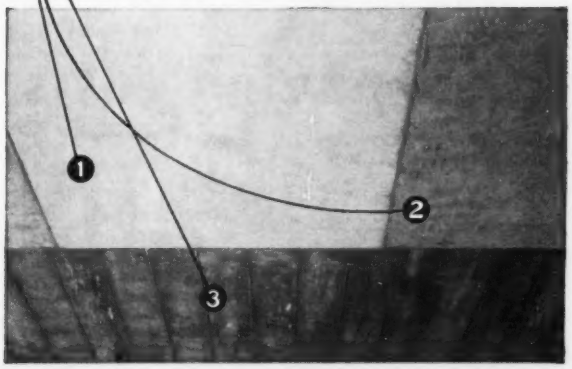
3 reasons why PLYGLAZE® high-density* overlaid plywood outperforms any form material on the market

1. FORMS SMOOTHER CONCRETE

Hard, glossy-smooth fused resin-fiber surfaces form flawlessly smooth concrete, with no trace of grain pattern. Unretouched photo shows marked difference in appearance quality of concrete cast against PlyGlaze, ordinary plywood and shiplap.

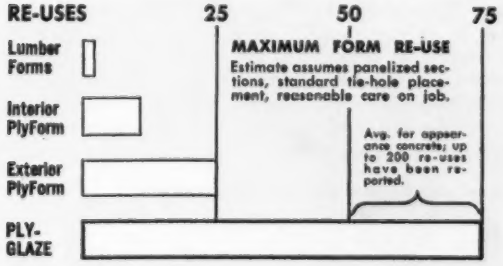
RELATIVE APPEARANCE OF CONCRETE

	Up to 50% of Max. Re-Use	Up to 100% of Max. Re-Use	Where to Use
1. PLYGLAZE	Excellent	Good	For smoothest concrete, maximum re-uses
2. PLYFORM	Good to Fair	Fair to Poor	For fairly smooth concrete, multiple re-uses
3. LUMBER	Poor	Very Poor	Where appearance and re-use not important



2. GIVES MANY MORE RE-USES

PlyGlaze's tough, hard surface stands up under hundreds of pours. With reasonable care, you'll easily get 50 to 75 re-uses. Actually over 200 have been obtained—and even then PlyGlaze continued to form good looking concrete.



3. HELPS CUT COSTS TWO WAYS

A. TIME & LABOR SAVINGS—Sharply reduces rubbing and finishing labor. Ceiling slabs can be painted direct, eliminating expensive plastering. PlyGlaze also cuts form construction, erection and stripping time. High re-use factor eliminates form reconstruction during job.

B. LOW COST PER USE—Even when cost is sole criterion, greater number of PlyGlaze re-uses frequently more than make up for higher initial cost, particularly where costs can be amortized over 25 or more pours.

COST PER-SQUARE-FOOT-PER-USE

No. Re-Uses ➤	1	10	25	50	100	200
PLYGLAZE	$0.375	.038	.015	.008	.004	.002
Exterior PLYFORM	.234	.023	.009	Gives Max. 25 Re-Uses		
Interior PLYFORM	.218	.022	Gives Maximum 10-12 Re-Uses			
LUMBER	.110	Gives Maximum 2-3 Re-Uses				

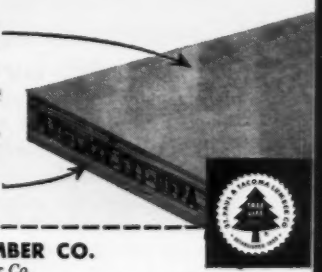
Estimates based on 30 month average for prices quoted by St. Paul & Tacoma for following material delivered in Chicago: ¾" PlyGlaze; ¾" Ext. & Int. PlyForm, mill oiled, edge sealed; 2 & btr. 1" green Douglas fir or hemlock.

POINTS IN BRIEF

- Has the strength, workability and adaptability of ordinary plywood.
- Strips easily; the non-absorbent surfaces will not stick to the concrete.
- No oiling is needed between the pours other than to facilitate cleaning.
- Overlay will not soften or come loose. Unharmed by alkaline reaction.
- Overlay minimizes moisture pickup and the resultant loss of rigidity.

Hard, glossy, translucent high density* fused-resin fiber overlay bonded to both sides of panel. Resin content controlled to give exact amount of hardness and wear resistance required for form work.

Base panel is top quality DFPA-inspected solid core Exterior fir plywood. Available in all standard sizes, thicknesses.



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Please send the material checked:

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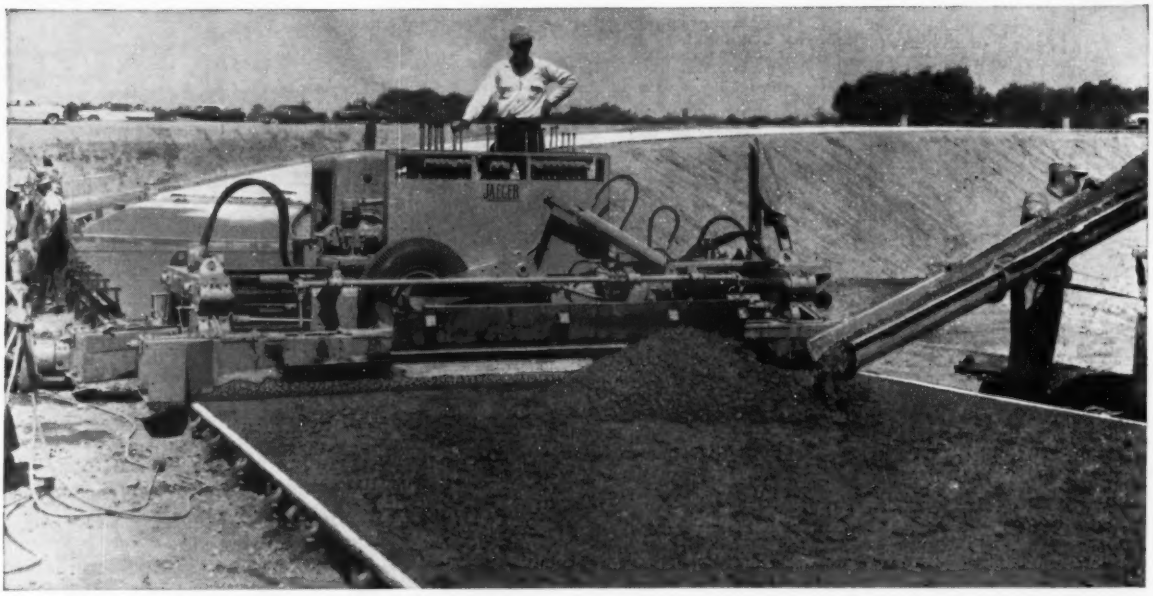
*HIGH DENSITY (glossy, translucent overlay) is special concrete form panel. MEDIUM DENSITY overlay (opaque with texture similar to drawing paper) is paint grade; not for form work.

(Advertisement)



ALL-HYDRAULIC, SELF-WIDENING FINISHER: Fast, flexible, precision-smooth. Gives you 6′ of infinite width adjustability with the touch of a lever — a tremendous time-saving on today's work. Gives you hydraulic drive and lever control of traction, screeding, diagonal rear screed swing, tamper attachment and transportation wheels. No mechanical transmissions; gear-type hydraulic pumps power every operation. Diagonally adjustable screed, supplied for pitched slab and superelevated curves, lays flush to higher form; single lever changes screed crown as needed. For variable width work, 3′ screed extensions have end shoes which adjust to any width, by worm.

How Jaeger machines cut paving costs

NO OTHER SPREADER CAN DO THIS: Perfect spreading and placement of concrete against both forms, even on superelevated curves, is just one of the exclusive advantages of the Jaeger Screw Spreader. Its screw action completely remixes and densifies the piled material and compacts it solidly against the subgrade and forms, resulting in a uniformly stronger slab free from honeycomb. Can be supplied with oscillating 12″ screed for precision strike-off ahead of finisher for maximum production. Jaeger Spreader-Finisher "teams" have laid up to 7280′ of 12′ turnpike slab in a single 13-hour day, with big cost savings.

LOW COST SPREADING OF AGGREGATES: Lay all the tonnage your trucks can deliver with this inexpensive paver-type Aggregate Spreader — any base or surface aggregate, or plant-mixed stabilized soil for highway or airport base, both base and top for secondary roads, parking areas, drives. Lays widths to 13′, up to 10″ thickness of coarse stone, or as much as 12″ of finer or graded materials. *All traction is on subgrade, never on loose, newly-laid material.* No displacement to cause high and low spots which compress unequally. Floating straight edge runners carry strike-off assembly, average out subgrade irregularities, insure smooth, accurate lay.

For full information on these machines and methods, operating data and prices, see your Jaeger distributor or write us.

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800 Dublin Avenue, Columbus 16, Ohio

AIR COMPRESSORS • PUMPS • CONCRETE MIXERS • TRUCK MIXERS

PRESENTING FOUR NEW INDUSTRIAL CHAMPIONS

BY

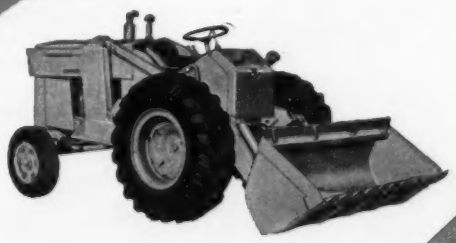
MASSEY-FERGUSON INDUSTRIAL EQUIPMENT

WORK BULL and DAVIS PRODUCTS

The Work Bull 303 with 500 Loader and Davis Backhoe

The Work Bull 202 with Matched Davis Loader and Backhoe

SEE HOW THESE VERSATILE POWER-MATCHED MACHINES SAVE ON MANPOWER AND EQUIPMENT EXPENDITURES



The Work Bull 1001 Multi-Purpose Tractor Loader

The Work Bull Fork Lift

MASSEY-HARRIS-FERGUSON, INC.

MASSEY-FERGUSON INDUSTRIAL DIVISION

1009 SOUTH WEST ST. • WICHITA 13N, KANSAS

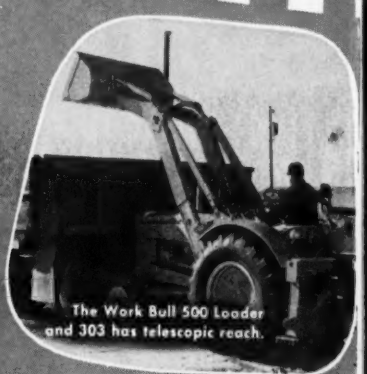
NEW WORK BULL and DAVIS

Integration of Work Bull 202 and Davis Loader gives greater reach, maneuverability, and "single-unit" efficiency.

Here's Massey-Ferguson Industrial Division's new line of industrial champions in the light and medium equipment field. All are designed to replace high-inventory, single-purpose machines—and at a fraction of the cost. Multiple, quick-change attachments are POWER-MATCHED to the basic tractor. You pick the power you need—and add the attachments you want. All from the same source. It will be the best investment you ever made in equipment!

Work Bull 1001 has instant reversing, 43-degree roll back.

Davis Backhoe digs flush or from center.



The Work Bull 500 Loader and 303 has telescopic reach.

LETS YOU PICK YOUR POWER TO MATCH YOUR PROJECT!

New WORK BULL 1001

Multi-Purpose Tractor Loader is convertible into eight different machines. You can change it in the field from a loader (⅞ cubic yard payload capacity) to a pick-up street sweeper, to a fork lift, angle dozer, crane, rotary broom, backhoe, or scarifier. This unit features 52 h. p. engine, instant reversing (without shifting), 43° bucket roll back at ground level, load-shock absorber, power steering, and torque converter.

New WORK BULL 202

Utility Industrial Tractor has 40 h. p., high-torque engine with amazing lugging power at low speeds. New industrial design permits extra maneuverability, vision, and control. It has more POWER-MATCHED attachments than any other tractor. Attachments include the famous Davis Loader-Backhoe and the Auburn Trencher. It beats anything in its price range.

New WORK BULL 303

Medium Range Industrial Tractor is designed for tough assignments that demand more power, more weight, and reserve stamina. It has 52 h. p. engine, instant reversing, torque converter, power steering, and new double-disc brakes.

New WORK BULL 500 LOADER

Work Bull 500 Loader with ¾ cubic yard payload capacity is specially matched to the Work Bull 303. It has direct line "bull-dozer" type thrust, but telescopic reach. Extra versatility is provided by pick-up street sweeper, crane, angle dozer, rotary broom, fork lift, and scarifier attachments. Davis Backhoe also fits directly to the loader frame.

New WORK BULL FORK LIFT

Work Bull Fork Lift has the power, stability, and flotation to be labeled the best material-handling device for either off or on hard surfaces. Controls are located at operator's finger-tips. It is equipped so you can make quick changeover from one attachment to the other without additional hydraulics. Attachments include standard tines, block forks with side-shift adjustment, hydraulic bucket, log hook, dozer blade, scrap grap, 20′ extension mast, bottled gas load clamp, and cotton bale clamp.

Matched DAVIS LOADER-BACKHOE

Davis Loader-Backhoe — The famous Davis Loader and Backhoe are specially matched to Work Bull 202. Loader attaches directly to the tractor which also has built-in pump drive and mounting. The Davis Backhoe fits directly to loader frame and can be attached or detached in less than five minutes. It is the only machine that can dig flush alongside a building – as well as do normal digging jobs. The Davis Loader, likewise, is highly versatile with many easy-to-change attachments.

Other ***Power-Matched Attachments*** for the Work Bull 202 and 303 tractors include a scarifier-scraper, post hole digger, mower, multi-purpose rear blade, soil scoop, cable layer, tipping trailer, cordwood saw, and telescoping wagon chasis

Get the Full Story On How To Save Manpower and Equipment Expenditures Write for this free copy of the 28-page, fully illustrated brochure on the complete Work Bull and Davis Line. Ask for Brochure G-4.

MASSEY-HARRIS-FERGUSON, INC.

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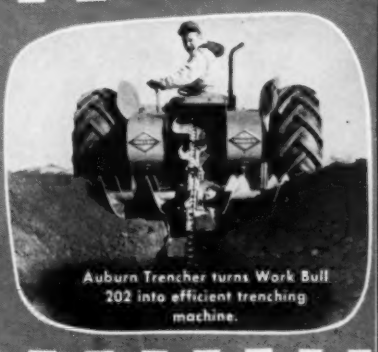
Work Bull Fork Lift with Block Tines and Side Shift adjustment.

Work Bull 1001 easily converts into pick-up sweeper.



Auburn Trencher turns Work Bull 202 into efficient trenching machine.

ROAD BUILDING with Symons Forms

Gang Forming . . . Symons wide panel forms made up in sections of 10' x 24' and 15' x 24' used to pour 2,400 foot long retaining wall.

Bridge Forming . . . By using Symons high strength forms, contractor was able to reduce pouring time, use fewer men and cut 100 days off bridge forming job.

Culvert Forming . . . A new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts.

Symons can help you with your forming problems. Our engineers will prepare complete form layouts and bill of materials at no obligation. Other Symons products used in road building are bar ties, tie chairs, column clamps and shores. Forms, shores and column clamps may be rented with purchase option—rentals to apply on purchase price. Information on Symons products and services sent FREE on request.

Symons CLAMP AND MFG. CO.

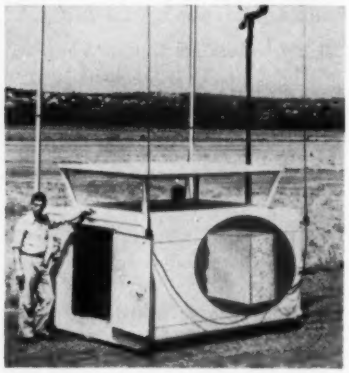
4255 Diversey Avenue Dept. D-8 Chicago 39, Illinois

JOB TALK . . .

continued from page 20

peared that the barge would have to stay aground. No tug could get close enough to the errant craft to set it free. But the stone crushing firm's marine superintendent ordered the company's Bell 47-G helicopter into action.

The pilot dropped the "chopper" onto the deck of the empty barge, tucked one of its floats against the starboard side and gunned its motor. The barge gave a lurch and eased out into the river where a tug could reach it.



Mobile Field Office

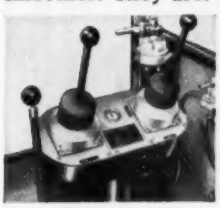
Want a lightweight, fireproof field office that you can move from job to job?

You can make your own from urethane foam or buy a Helicop-Hut ready-made from Craig Systems Inc., of Danvers, Mass. The ready-made foam structures come in various sizes and are coated inside and out with sheets of aluminum for rigidity, protection, and appearance. Most huts can be lifted onto trucks with ease, fitted with rollers to be made mobile, or even carried by helicopter.

To build your own, just buy the urethane ingredients, mix them into liquid state, then pour the liquid into a form made to the shape and size of the hut you want. The liquid urethane will quickly foam out to 30 times its original volume. When the foam dries, it will have enough structural strength to protect itself against anything but severe weather and handling. These problems are met by coating the walls with a skin of aluminum or other like material.

This Shovel Makes Good Operators Look Better!

The 2½-yd. Lorain-85A Shovel has two vitally important features—available on no other make of shovel—that will send any operator's production figures soaring, with less effort, less fatigue, easier, smoother. They are:



"JOY-STICK" AIR CONTROLS

These 2 levers, through metering valves that retain the old-time normal "feel" of the machine, control all turntable operations through air power. There are fewer levers—fewer motions. Just think what this ease and simplicity of operation means in increased production. Full "Air-Ease" Power Control of crawler travel, steering and tread-travel lock also are provided.

"SHEAR-BALL" MOUNTING

Like a huge, sealed "ball bearing," this revolutionary turntable mounting eliminates forever all adjustment, maintenance and lubrication problems of old-fashioned center pin and roller designs . . . means still more time-saving on the job, more production. Field tested for more than 7 years, the Lorain "Shear-Ball" is real "reliability" in action.

There are many other Lorain-85A features you'll want to know about. Your nearby Thew-Lorain Distributor can tell them to you. And ask him about the on-the-spot Lorain parts and service facilities that are such an important plus value when you buy Lorain. See him soon.

THE THEW SHOVEL CO., LORAIN, OHIO, U.S.A.

LORAIN 85A

THEW LORAIN®

reliability in action

NEW INTERNATIONAL®

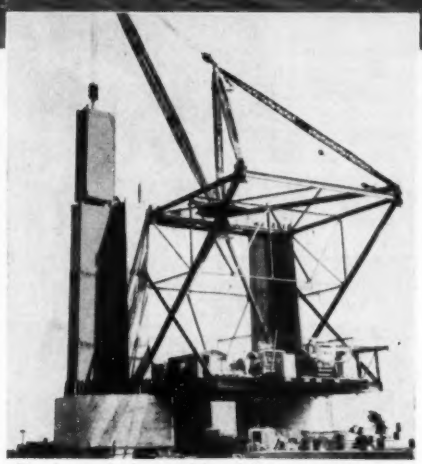
From suspension towers to completion

Clyde Hoists 'Pull' World's Longest Suspension Bridge Across Mackinac Straits

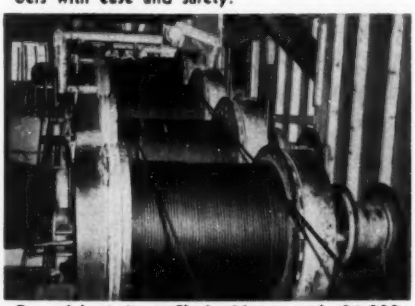
On the construction of the famous Mackinac Straits Bridge by American Bridge Division, United States Steel Corp., Clyde Hoists were used throughout the operation from erection of the suspension towers to completion of the bridge itself.

Time is big money on a project of this size. Any down time throws a monkey wrench into working schedules and makes costs climb rapidly. For dependable and continuous operation, leading contractors all over the world select Clyde Hoists. Their all steel bed and side frames provide exceptional ruggedness without excessive weight. Large diameter brakes and internal, expanding band friction clutches give smooth and positive load control. Anti-friction bearings throughout reduce maintenance . . . more advantages that owners and operators like in Clyde Hoists.

It takes a lot of features to add up to a superior quality, work-hungry hoist . . . one that will smoothly and swiftly spot loads with safety, without operator fatigue and without down time. All these and many other outstanding and exclusive features of Clyde Hoists are the result of the 60 years of engineering and manufacturing know-how that goes into every Clyde.



The husky brakes and band friction clutches of these mighty Clyde Hoists, made it possible to accurately position the heavy bridge members with ease and safety.



Powerful, 4-drum Clyde Hoists with 21,000 pound line pull operate the traveling derricks to set columns of the suspension towers on the Mackinac Straits Bridge job.

Write today for complete information on Clyde Hoists

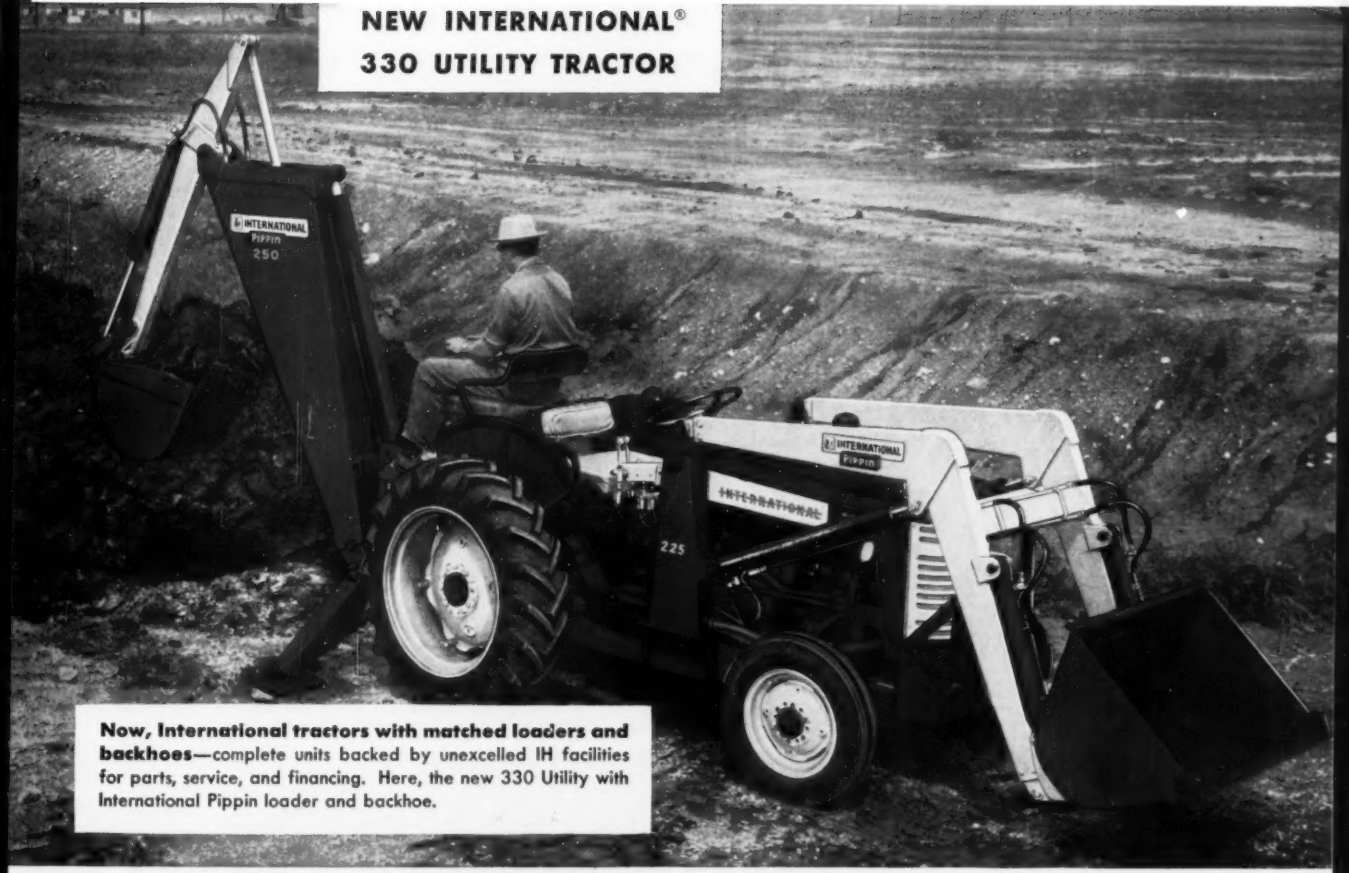
CLYDE RIC

CLYDE IRON WORKS, Inc.

Established 1899

DULUTH 1, MINNESOTA

HOISTS : DERRICKS : WHIRLEYS : BUILDERS TOWERS
UNLOADERS : CAR PULLERS : ROLLERS



NEW INTERNATIONAL® 330 UTILITY TRACTOR

Now, International tractors with matched loaders and backhoes—complete units backed by unexcelled IH facilities for parts, service, and financing. Here, the new 330 Utility with International Pippin loader and backhoe.

NOW! MORE 'BEEF'

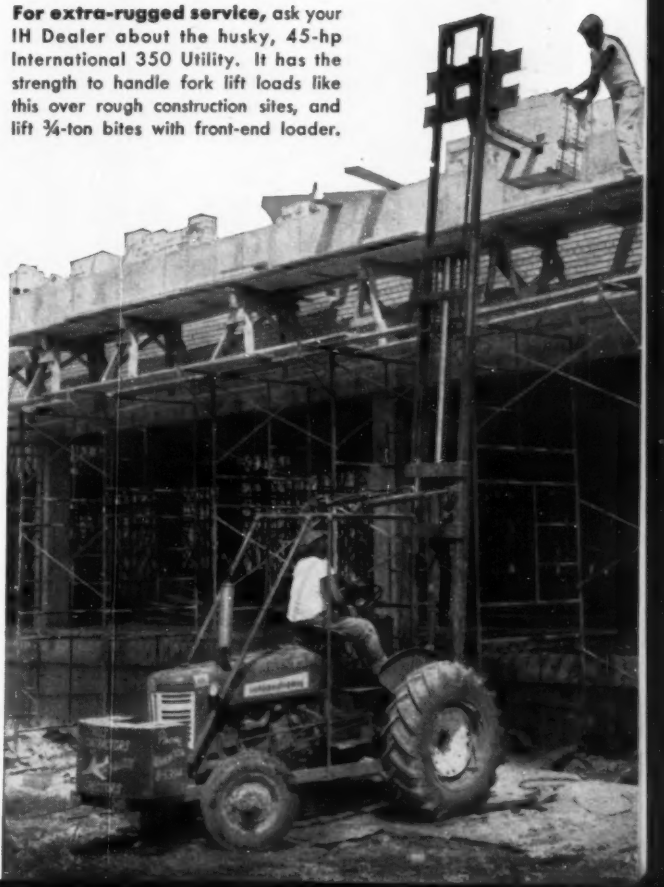
than ever before in a 35 hp rig!

It's terrific for trenching, loading, 'dozing! Now you can get an International tractor in the economical 35 hp class, with strength and stamina for high capacity and low maintenance. The new International 330 Utility has up to 900 pounds greater built-in weight than other tractors of similar horsepower—really *rugged* construction! Handle 1,000 pounds with a front-end loader, lift 4,000 pounds with rear-mounted fork, dig faster with heavy-duty backhoe.

ALL the work-easing features of larger IH tractors are available—10 speeds forward with Torque Amplifier drive . . . power steering . . . job-tailored Hydra-Touch equipment control . . . Fast-Hitch.

See how heavy-duty design can cut your costs! Phone your IH Dealer. He will be glad to demonstrate. For free catalog, write International Harvester Co., Dept. CE-1, P. O. Box 7333, Chicago 80, Ill.

For extra-rugged service, ask your IH Dealer about the husky, 45-hp International 350 Utility. It has the strength to handle fork lift loads like this over rough construction sites, and lift ¾-ton bites with front-end loader.



SEE YOUR
INTERNATIONAL HARVESTER DEALER

International Harvester Products *pay for themselves in use*—Farm Tractors and Equipment . . . Twine . . . Commercial Wheel Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois

THE BRADFORD

Maintenance Man's Dream

16,000 hours without major overhaul: Since 1947, this shovel has been in continual operation using Cities Service Motor Oil. Two factors enabled this performance. First, due to extremely dusty conditions, Bradford Weston made oil changes every 150 hours and changed filter every 500 hours. Second, the extremely effective additive combination used in Cities Service C-300 Motor Oil has held sludge, carbon, and varnish to the barest minimum.

13 years—same bearings: Incredible as it may sound, that's the record of Bradford Weston's gyro-crusher using Cities Service Pacemaker 7 Oil. Fortified against oxidation, rust and foaming, Pacemaker 7 is the ideal oil for circulating systems in this type of service. Bradford Weston changes the oil three times a year. Aggregate from the crusher is sold for road construction and similar purposes. Bradford Weston also sells riprap for shore protection.

WESTON STORY

Come True

Many are the maintenance men who have dreamed of the kind of results that Bradford Weston Inc. of Hingham, Mass., is actually getting! Here, for the doubtful, is a machine-by-machine account of their phenomenal results with precision maintenance and Cities Service lubricants.

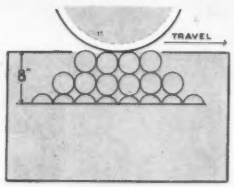
After 225,000 miles, a diesel-driven rock truck still needs no overhaul. Since 1952, it has provided outstanding performance using Cities Service C-100 Motor Oil. Two others went 150,000 miles before major overhaul. Oil is changed every 5,000 miles, filter every 1,000 miles. Trucks also use Cities Service Diesel Fuel and Multi-Purpose Trojan H-2 Grease. The grease is excellent for chassis, wheel bearings and water pump. Reduces and simplifies inventory.

3,000 hours and plenty of service ahead: That's the story for this front end loader, using Cities Service C-300 Motor Oil. Bradford Weston also has two three-quarter-yard cranes that have operated for seven years without overhaul, using Cities Service fuels and lubricants. Meanwhile, jack-hammers grind away through all kinds of weather with Cities Service Neptune 2-Z—the rugged lubricant that stays fluid and resists oxidation at all temperatures.

CITIES SERVICE

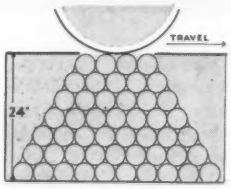
QUALITY PETROLEUM PRODUCTS

TERRAPAC WINS ANOTHER JOB AGAINST 50-TON ROLLER



CONVENTIONAL STATIC COMPACTION

Static rollers, relying on weight alone, produce friction forces between soil particles causing bridges to form. Terrapacs break bridges for deep compaction.



TERRAPAC DYNAMIC COMPACTION

Vibratory energy breaks frictional forces binding soil particles together, allows soil to sift down producing uniform densities at greater depths.

12 CH-30 Vibratory Rollers Tame 8,000,000 Yards on Griffiss Air Force Base

Once again the Terrapac way of compaction has made a name for itself, this time on the Griffiss Air Force Base in Rome, New York where the contractor compacted 7000 yards a day achieving 97, 98, 101 and 103 percent modified AAHSO density respectively in 2, 4, 6 and 8 passes . . . Moreover, this desired density was often obtained with lifts up to 15 in. compacted thickness (6 in. with 12 in. maximum specified) . . . This site consisted almost entirely of sandy silt, ranging from fine to coarse, with traces of clay usually in thin laminations . . . As a result of this showing, 12 Terrapac CH-30 vibratory rollers were picked as chief compaction tools . . . Contact your local Vibro-Plus distributor, let him arrange a Terrapac demonstration, and, if desired, supply you with complete details on the above job.

41-51

VIBRO-PLUS PRODUCTS, Inc.

STANHOPE, NEW JERSEY

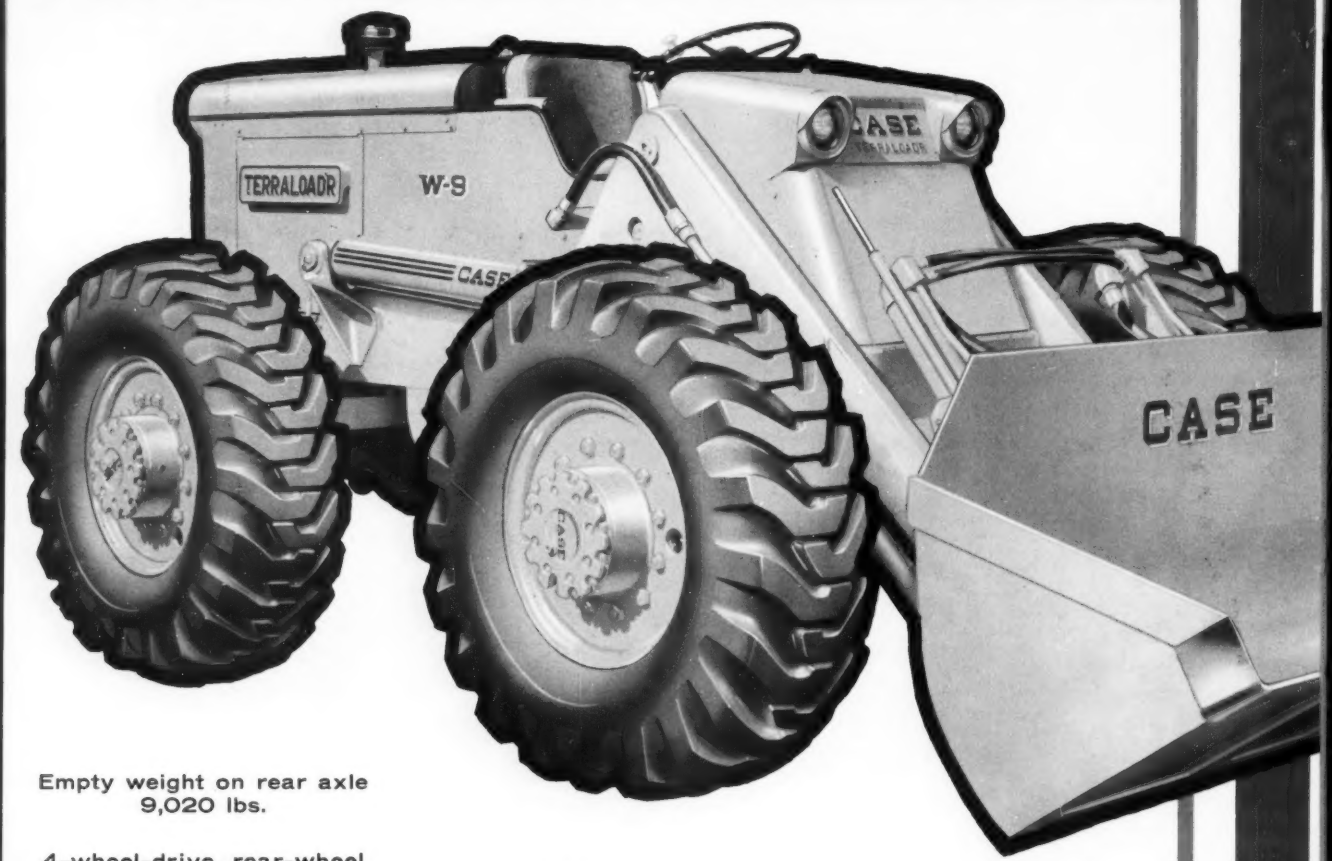
WORLD'S LEADING MANUFACTURER OF VIBRATORY EQUIPMENT FOR OVER TWO DECADES!

Announcing the revolutionary

CASE® W-9 TERRALOAD'R

1⅜ to 2¾ cu. yd. capacity
Four-wheel-drive, rear-wheel steer

CASE 1st in quality for over 100 years



Empty weight on rear axle
9,020 lbs.

4-wheel-drive, rear-wheel
power-steer

Full power-shift in all speeds
plus forward and reverse

Empty weight on front axle
6,660 lbs.

Total weight—15,680 lbs.

11,000 lbs. break-out force

5,000 lbs. carrying capacity

Powerful high-torque Case gasoline or diesel engine, equipped with power-boosting torque-converter drive, gives the Case W-9 Terra-load'r up to *40,000 lbs.** of crowding power for fast digging in hard materials. Direct thrust design utilizes full power and prying action of machine for maximum digging efficiency. Operator always has clear view of bucket.

*Assuming adequate traction

40° bucket rollback, combined with properly balanced weight distribution, enables the Case W-9 to carry bigger payloads at higher speeds — with less spillage — and without the usual "bounce and forward-dip" experienced with conventional rubber-tired loaders. Full power steering on rear wheels makes unit extremely easy to turn and maneuver.

Short, rigid lift-arms, pivoted *ahead* of the operator, provide 62½" of forward reach for pitching loads into center of truck. This exclusive feature also gives operator unobstructed visibility on both sides . . . eliminates danger of catching operator's arm in lifting mechanism . . . makes it easy to get on or off machine any time, without climbing over boom arms.

NEW CASE® W-9 TERRALOAD'R

revolutionizes loader performance on rubber ...saves you up to $2000 in first cost!

Here, at last, is a big capacity *4-wheel drive, rear-wheel-steer* loader that gives you all the advanced performance features you've been wanting in this type of unit — at savings *up to $2000 in first cost.* With the new W-9 Terraload'r you get . . .

Better balance and stability — Improved weight distribution, with 37% more empty weight on rear wheels, provides better traction for tough digging, without "bucking", or raising rear wheels off ground. This, together with better lateral stability, enables you to dig, maneuver and dump heaping payloads faster, easier, more safely.

Improved operator safety — Operator has unobstructed visibility in all directions . . . can get on or off machine in a hurry. And all boom-lifting mechanisms are completely out of the way!

Power matched to the job — High-torque Case gasoline engine (or famous all-weather-starting Case diesel), with torque-converter drive, insures adequate power for all digging and loading operations — with *maximum* fuel economy, dependability and long life.

Constant-mesh power-shift transmission — Provides three forward and reverse speed ranges — from 0 to 21 MPH — automatically balanced to changing loads, with full power-shift on-the-go in all speed ranges, as well as forward and reverse. Two conveniently located levers — one for speed selection, one for forward and reverse — give instant, positive control without mechanical shifting.

One warranty, one service source — Complete machine — *including the engine* — is engineered, built and fully warranted by J. I. Case Company, and serviced by reliable Case Industrial Dealers everywhere. No costly delays on parts! No "split-responsibility" on service!

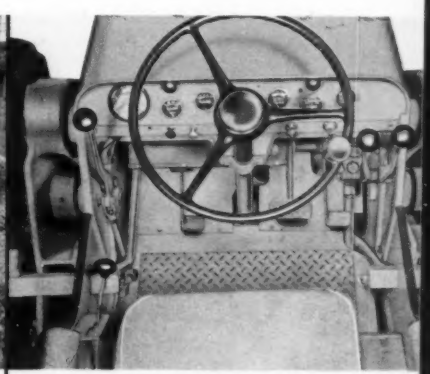
Investigate today — Call or write your nearest Case Industrial Dealer for full information, including details of new Case financing and LEASE plans to fit your needs, without tying up needed working capital.

3 Bucket Sizes

1⅜ cu. yd.—for tough digging
1¾ cu. yd.—for std. materials
2¾ cu. yd.—for light materials

Big 42.5 GPM hydraulic pump teams with husky double-acting lift and bucket-tilt cylinders to give the Case W-9 Terraload'r a terrific break-out force of 11,000 lbs. at ground level. Carrying capacity in travel position is 5,000 lbs. All-weather cab (shown in above illustration), together with heater and other deluxe accessories, are optional at extra cost.

Wide, flat-bottom Case bucket gets heaped loads fast . . . raises to full lift-height in 7½ seconds. Automatic sight-leveling gauge on right bucket tilt-cylinder tells bucket-angle at a glance, enables operator to adjust bucket to ground level position while lowering. Transmission is automatically disengaged by touching brake, for max. hydraulic power.



Operator rides in a comfortable air-controlled seat, fully adjustable fore and aft, with all controls within easy reach. Readable-at-a-glance instruments are color-coded for proper operating range. Two handy foot throttles — one on right side for normal operation and one on left — make it easy to "gun" engine with left foot, while right foot operates brakes.

You get better visibility ...more side stability with

NEW CASE® W-9

Note the clear view ahead from the operator's position in the Case W-9 Terraload'r. No dangerous "blind-spots" from massive yokes or bucket linkage. You also get much better side stability due to the W-9's *low center of gravity and wide wheel tread.* These exclusive features, together with shorter, more rigid lift arms — pivoted *ahead* of the operator's compartment — enable you to *maneuver bigger loads faster, easier* — without the usual "swing and sway" encountered with other 4-wheel-drive loaders.

Add the advantages of longer forward reach, plus *improved "fore and aft" stability,* and you'll quickly see why the new Case W-9 is already being acclaimed as the *safest, easiest-handling 4-wheel-drive loader in its capacity range.* Call your nearest Case Industrial Dealer today for the complete story, including details of new Case financing and LEASE plans, with easy monthly payments, tailored to fit your needs.

Investigate this new Case-built, Case-powered Terraload'r today

Long-term lease or purchase plans to fit your needs

Ask your nearest Case Industrial Dealer to show you how you can LEASE the new W-9 Terraload'r — as well as other Case® TerraTrac® industrial wheel and crawler units — *on easy monthly rental terms* — WITHOUT tying up needed capital. Your Case lease contract may also contain an *"option to purchase"* at any time, with all prior rental payments credited on purchase price. Investigate today!

Brief W-9 Specifications

LOADER

Bucket capacity (heaped)	1⅜, 1¾ and 2¾ cu. yds.
Break-out force	11,000 lbs.
Carrying capacity	5,000 lbs.
Rollback at carry	40°
Forward reach (at 7' dump)	62½"

TRACTOR

Gross engine HP (Gasoline)	69.5
Gross engine HP (Diesel)	65.7
Axles	Spiral bevel with planetary reduction in hub
Torque converter	Single Stage — 3.5 to 1 Stall ratio
Transmission	Full power-shift, 3 speeds forward and reverse
Max. lbs. push or pull (Fwd. or reverse)	
1st	40,000
2nd	11,500
3rd	4,970

Assuming adequate traction, the torque converter automatically adjusts drawbar pull or push to the above loads within following speed ranges:

	Forward	Reverse
1st	0 to 2.4	0 to 2.4
2nd	0 to 6.5	0 to 6.5
3rd	0 to 21.0	0 to 21.0

Tires (4) Standard	14.00 x 24 — 8-Ply tubeless
Overall length at carry	18'3"
Overall width (over hub)	93"
Approx. weight	15,680 lbs.

Clip...mail for free catalog

J. I. CASE COMPANY, Racine, Wis., U.S.A.

☐ Send free catalog on new W-9 Terraload'r

☐ Send name of nearest Case Industrial Dealer

Name ..... Title .....

Employed by .....

Address .....

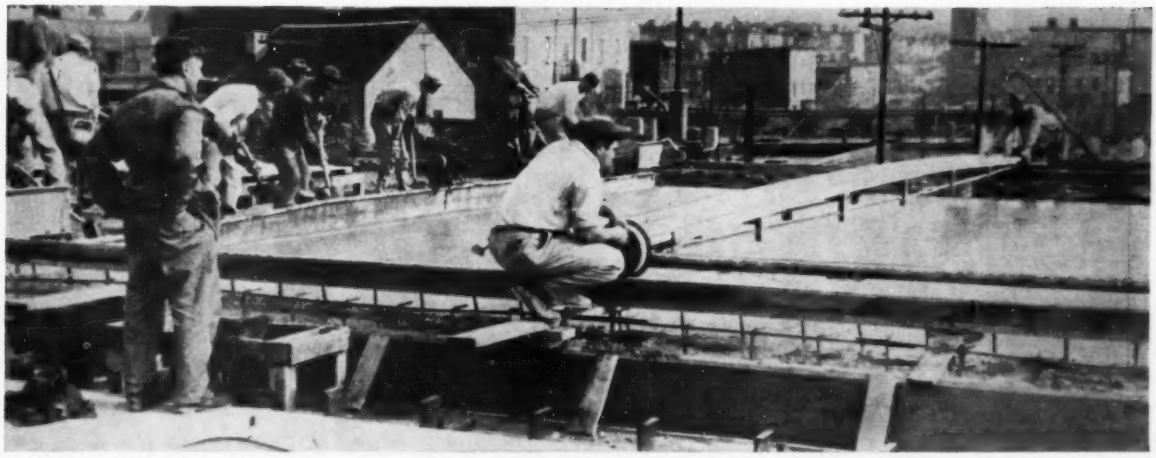
City ..... State .....

C-TL-138

CASE 1st in quality for over 100 years

Litho in U.S.A.

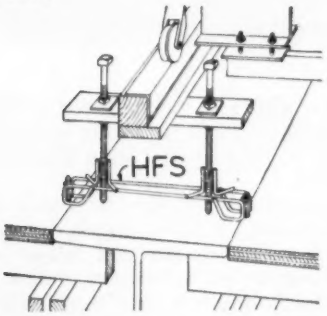
(Advertisement)



Brookfield Construction Company screeds three lanes at once.

Skillful screeding, Richmond supports, pay off in fast, accurate slab finishing

A new screeding technique developed by Brookfield's superintendent, Jack Sorensen, paid off handsomely on this elevated highway extension of the New Jersey Turnpike. An 800-lb., 36-ft., vibrating screed blade was used, with supporting angle-covered 3 x 4's held firmly in place every 7-ft. by Richmond Hanger Frame Screed-Rail Supports. This made it possible to screed three lanes in one operation. Besides gripping the rail with extra firmness, the Richmond bases permitted the heights to be set exactly—from the top—with simple screw-head adjustments.



Brookfield's new technique and insistence on Richmond Screed Supports are typical of the emphasis on proper slab finishing among progressive contractors. Good screeding means a lot more than producing a good looking slab. For, unless the surface is finished without dishes or highspots and with design level maintained, the slab will not drain properly and will not satisfactorily resist weather and wear. In order to maintain levels, screed rails must be accurately positioned and held, so that they will not move during pouring and finishing. That is why the construction industry is showing such preference for Richmond Screed Supports with their adjustability and extra strength.

Equally important to good screeding, is having rail supports that are exactly suited to the job and to the screeding equipment to be used. The Hanger-Frame type used by Brookfield is only one of the complete line of Richmond Screeds.

In both the Richmond Standard Series and the special Series D supports, there is a wide range of sizes, weights and models. There are Richmond supports for use with hand screeds and vibratory screeds, and adaptable to power equipment. There are also Richmond heads to match any rail, whether pipe, T-bar, or special shape.

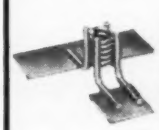
Whatever the type or size, all Richmond screeding devices, form brackets, and form and curb bolts provide the extra strength that not only saves money but ensures a better job. A number of the Richmond supports are shown at right. You will find all of them, and all Richmond screeding items, fully described in a new handbook just published—along with the full line of Richmond-engineered concrete tying devices, anchorages, and accessories. For your copy, or for help on any specific type of concreting problem, write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 So. Fourth Street, St. Joseph, Mo.

A FEW OF THE MANY TYPES OF RICHMOND SCREED-RAIL SUPPORTS

Richmond Adjustable Screed Chairs come in both the Standard (½" dia.) and D (¾" dia.) Series. Opposing legs that interlock and cannot spread or bend assure even distribution of load. Two new heights, 7½" and 10", have been added in the Standard Series. For unusually thick slabs, there are Richmond Special Height Screed Chairs.

Richmond Offset Screed Chairs have built-in support to take cantilevered load when rail must be placed above surface, as, for instance, when reinforcing steel runs opposite to screeding direction. Richmond Offset Screed Head can be quickly adjusted from above with speed wrench; is double-ended for use with either pipe or T-rail.

Richmond Fill-Type Adjustable Screed Base, used when slab is over soft fill, provides stability with four extended legs driven into ground. Richmond Sub-Grade Stake (not shown) does similar job for heavier loads below grade.



Richmond-Sub-Grade Base provides 2"-high support with unequal bearing plates. It is used mainly with shorter screed bolts or as base for form bolt. Sub-Grade Chairs (not shown), 3½" to 18" high, are also available for soft sub-grade fill.

Richmond Form Bracket, can be nailed to a joist to support a screed bolt extending through the decking. May also be used in conjunction with a curb bolt to support and position a curb form. Consists of a ½" or ¾" coil welded to a steel plate equipped with four nail holes.

Litho in U.S.A. C-TL-138

Here's the new sweetheart of the Task·Force fleet, Chevrolet's new Fleetside pickup! No truck has ever been better to look at . . . or better for your business.

Long, sweeping lines, graceful body contours . . . *new* truck appearance that's fleet, dashing and completely modern! Yet there's even more to the new Chevrolet Fleetside than the striking beauty that first meets your eye. There's *size*, for instance: extra room inside to pack many additional cubic feet of payload. In lengths of either 78 inches or 98* inches and a full six feet in width, this new body actually provides 50% more cubic capacity than the conventional pickup box!

And with an extra-sturdy build—the result of features like double-walled lower side panels, durable hardwood floor and solidly constructed full-width tailgate—the new Fleetside is the toughest of pickup bodies, made to stand up under a steady pounding. A new adjustable latch keeps graintight tailgate free from rattles.

Here's a new high in hard-working utility matched by styling that stands out on any street and speaks volumes about both you and your business. See and try the latest in pickups, the new Chevrolet

CHEVROLET **CHEVROLET**

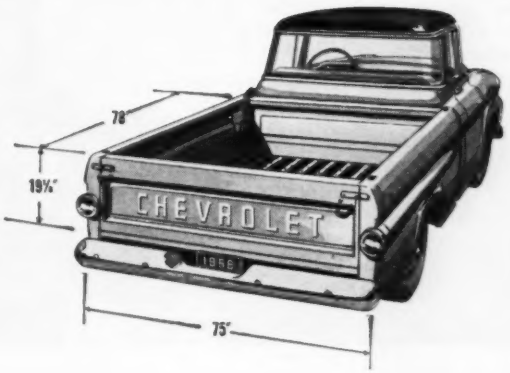
BY CHEVROLET

Fleetside, at your Chevrolet dealer's now! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**Optional at extra cost.*

More load space than any other comparable low-priced pickup. Up to 75.6 cubic feet of load space to pack bigger cargoes and help you get more done each day. The new Fleetside body is so wide you can haul standard 4′ x 8′ sheets of building material and still have room along the sides for extra items of payload!

Plenty of work-whipping hustle and muscle. Your choice of two great engines that know how to save—standard 145-h.p. Thriftmaster 6 or optional at extra cost 160-h.p. Trademaster V8. And Fleetside chassis components are truck-engineered down to the last bolt; they'll take all the abuse your most bruising hauls can give them!

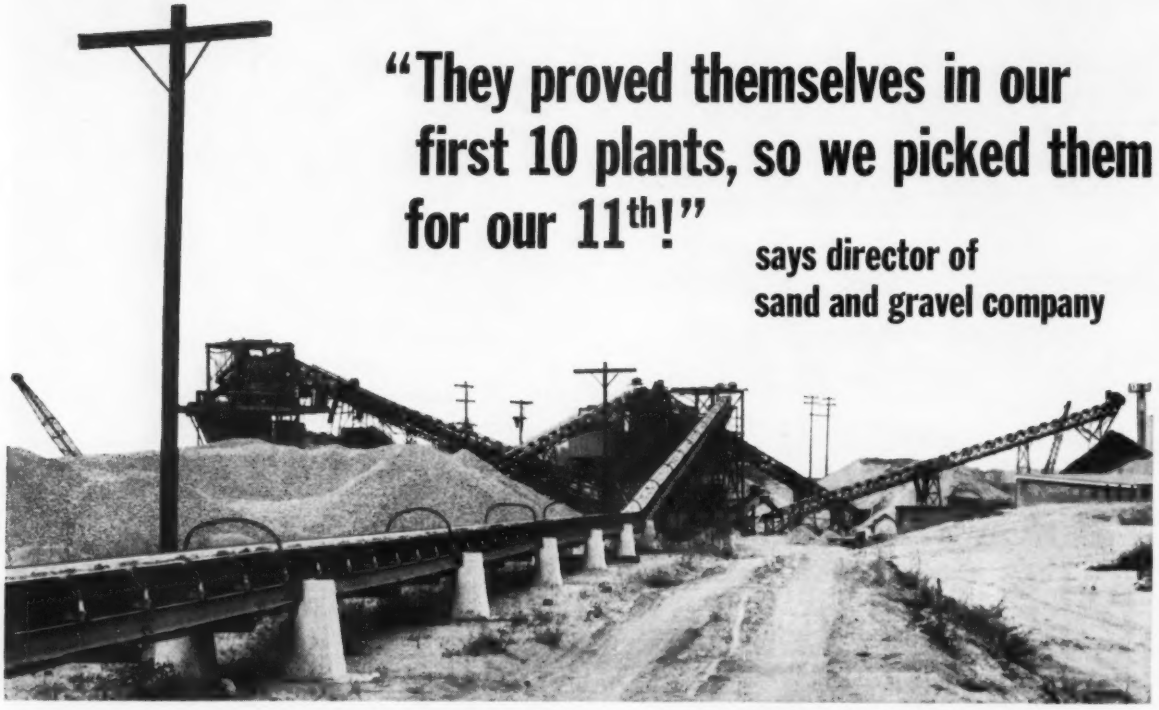


TASK · FORCE TRUCKS

US RUBBER CONVEYOR BELTS

"They proved themselves in our first 10 plants, so we picked them for our 11th!"

says director of sand and gravel company

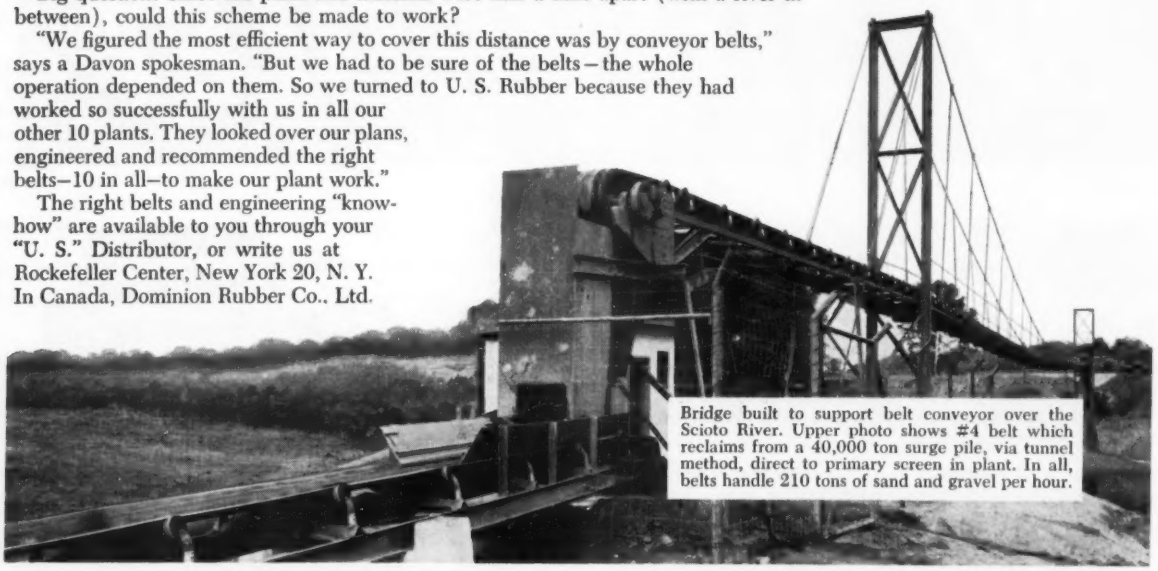


When Davon, Inc., built its 11th plant recently, they decided it would be more economical to bring the material to the plant rather than the plant to the material.

Big question: Since the plant and material were half a mile apart (with a river in between), could this scheme be made to work?

"We figured the most efficient way to cover this distance was by conveyor belts," says a Davon spokesman. "But we had to be sure of the belts—the whole operation depended on them. So we turned to U. S. Rubber because they had worked so successfully with us in all our other 10 plants. They looked over our plans, engineered and recommended the right belts—10 in all—to make our plant work."

The right belts and engineering "know-how" are available to you through your "U. S." Distributor, or write us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.



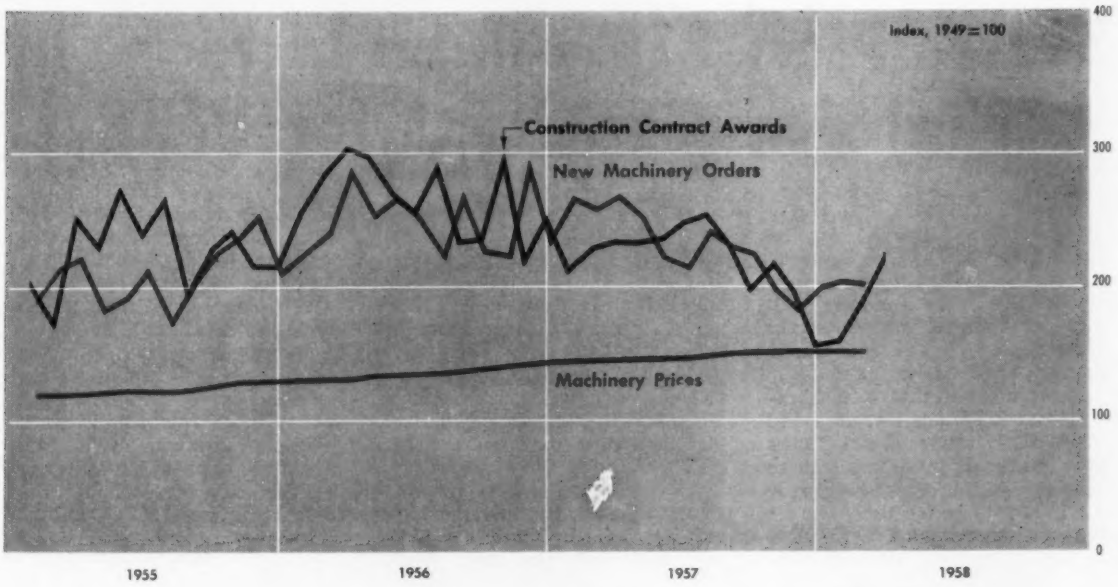
Bridge built to support belt conveyor over the Scioto River. Upper photo shows #4 belt which reclaims from a 40,000 ton surge pile, via tunnel method, direct to primary screen in plant. In all, belts handle 210 tons of sand and gravel per hour.

US RUBBER **Mechanical Goods Division**

United States Rubber

See things you never saw before. Visit U. S. Rubber's New Exhibit Hall, Rockefeller Center, N. Y.

Trends in the Machinery Market



Price Index

	FEB 1958	MONTH AGO	YEAR AGO	PERCENT CHANGE 1957-1958
All Types of Equipment	165.5	165.5*	156.3	+ 5.9
Cranes, Draglines, Shovels	**163.0**	**163.0**	**157.2**	**+ 3.7**
Shovel, ½ cu yd	153.7	153.7	149.0	+ 3.2
Shovel, ¾ cu yd	167.4	167.4	158.9	+ 5.3
Shovel, 1-1½ cu yd	174.3	174.3	165.8	+ 5.1
†Shovel, 2-2½ cu yd	154.4	154.4	139.2	+10.9
Shovel, 3-3½ cu yd	162.7	162.7	154.1	+ 5.6
Shovel, 6 cu yd	179.5	179.5	170.9	+ 5.0
Crane, tractor mounted	164.2	164.2	161.0	+ 2.6
Crane, truck mounted	152.7	152.7	152.7	0
Bucket, clam shell	180.8	180.8	180.8	0
Bucket, dragline	135.1	135.1	126.6	+ 6.7
Scrapers and Graders	**158.8**	**158.8**	**148.9**	**+ 6.6**
†Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	145.2	+ 6.7
†Scraper, 4 Wheel, 12-15 cu yd	151.3	151.3	140.6	+ 7.6
Scraper, 2 Wheel, 14-18 cu yd (a)	122.7	122.7	113.6	+ 8.0
Grader, heavy duty	164.0	164.0	154.1	+ 6.4
Grader, light & medium	161.2	161.2	152.2	+ 5.9
Tractors (non-farm, incl Industrial)	**181.0**	**181.0***	**168.7**	**+ 7.3**
Wheel-type, off-highway (a)	128.4	127.7	118.6	+ 8.3
†Crawler-type, 45-60 dhp	182.6	182.6	171.9	+ 6.2
60-80 dhp	185.8	185.8	174.8	+ 6.3
80-120 dph	186.7	186.7	172.3	+ 8.4
120 and up dhp	191.8	191.8	178.0	+ 7.8
Machinery, Tractor Mounted	**161.7**	**161.7**	**154.3**	**+ 4.8**
Dozer, cable controlled	151.6	151.6	149.0	+ 1.7
Dozer, hydraulic controlled	177.3	177.3	169.8	+ 4.4
Cable, power control unit	147.9	147.9	136.6	+ 8.3
Loader, shovel type	153.9	153.9	146.5	+ 5.1
Specialized Machinery	**150.2**	**150.2**	**142.5**	**+ 5.4**
Ditcher	154.1	154.1	151.8	+ 1.5
Roller, tandem	193.2	193.2	172.8	+11.8
Roller, 3 wheel	161.6	161.6	148.6	+ 8.7
Ripper and rooter	143.3	143.3	132.8	+ 7.9
Dewatering pump, 10 M gph	111.7	111.7	108.1	+ 3.3
Dewatering pump, 90 M gph	142.4	142.4	133.3	+ 6.8
Portable Air Compressors	**159.1**	**159.1**	**146.2**	**+ 8.8**
Contractor's Air Tools	**164.3**	**164.3**	**150.0**	**+ 9.5**
Mixers, Pavers, Spreaders	**149.3**	**149.3***	**141.7**	**+ 5.4**
Mixer, portable, 6 cu ft	151.5	151.5	142.9	+ 6.0
Mixer, portable, 11 cu ft	160.1	160.1	150.5	+ 6.4
Mixer, portable, 16 cu ft	163.7	163.7*	152.6	+ 7.3
†Mixer, truck, 6 cu yd	128.1	128.1	120.1	+ 6.6
Mixer, paving, 34 cu ft	185.2	185.2	166.8	+11.0
Concrete finisher & spreader	173.0	173.0	166.3	+ 4.0
Bituminous distributor	122.4	122.4	115.9	+ 5.6
Bituminous spreader	160.3	160.3	160.3	0
Bituminous paver	153.0	153.0	149.8	+ 2.1

• a Index based on January, 1955 = 100 • * Revised • † Specs changed
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49 = 100

Contract Awards Score Sharp Gain

Construction contractors and suppliers are feeling more confident now than at the beginning of the year. The reason: heavy construction awards are rebounding fast from last December's 32-month low.

Awards reported by Construction Methods increased sharply in February and again in March. The $1.4-billion let during March lifted the Contract Awards Index to 223 (based on 1949=100) up 19% over February and 44% higher than December, 1957.

Though March's total was well below 1956's record for the month, it ranks close behind March, 1957, and March, 1955.

Moreover, it's much greater than volume for any March prior to 1955.

The contract upturn appears to be a solid base for an expansion in awards during the second quarter. State and municipal public works will gain momentum during the next three months and should at least sustain the rate of total awards close to the March volume. And while big month-to-month increases such as occurred in February and March probably will not be maintained, smaller increases are likely in the months ahead.

The firming up in contractors' new business is reflected in new orders for construction machinery. February orders held close to January's volume.

Machinery Prices Steady

Machinery prices held steady for the fourth consecutive month in February, as measured by the Bureau of Labor Statistics indexes of manufacturer's prices. The only change was a slight rise in rubber-tired tractors.

States Plan $1.2 Billion Increase in Highway Contracts for 1958

CONTRACTORS face the happy prospect that 1958 will bring the biggest increase in highway contract awards ever recorded in a single year. The increase will mean that contractors can expect to sign up a record volume of new highway business.

Plans indicate that state highway and toll roads awards could zoom $1.2 billion above 1957's previous record total. This is more than double the 1956-57 increase.

All but three of the 47 state highway departments that replied to a Construction Methods survey said they plan to award more contracts this year than last. Their plans call for an over-all 41% increase over 1957 to a total of $4.6 billion. If Arkansas, which did not report, manages just to match its 1957 total this year, the total highway contract potential for 1958 will amount to a whopping $4,909 million, including planned toll road awards. This is 33% more than 1957 awards.

As you would expect, plans for interstate awards show the biggest increase—up more than 85% over last year. But more work also is scheduled for "ABC" federally aided state highways, up 17%, and for roads financed by the states alone, up 11%.

Toll road awards in '58 will be much less than in '57. The extent of the decline depends on the Massachusetts Turnpike Authority, which says it might let $150 million in contracts this year "if the money is available." Adding this to the plans of five other toll agencies makes the 1958 toll road contract potential $231 million.

continued on page 44

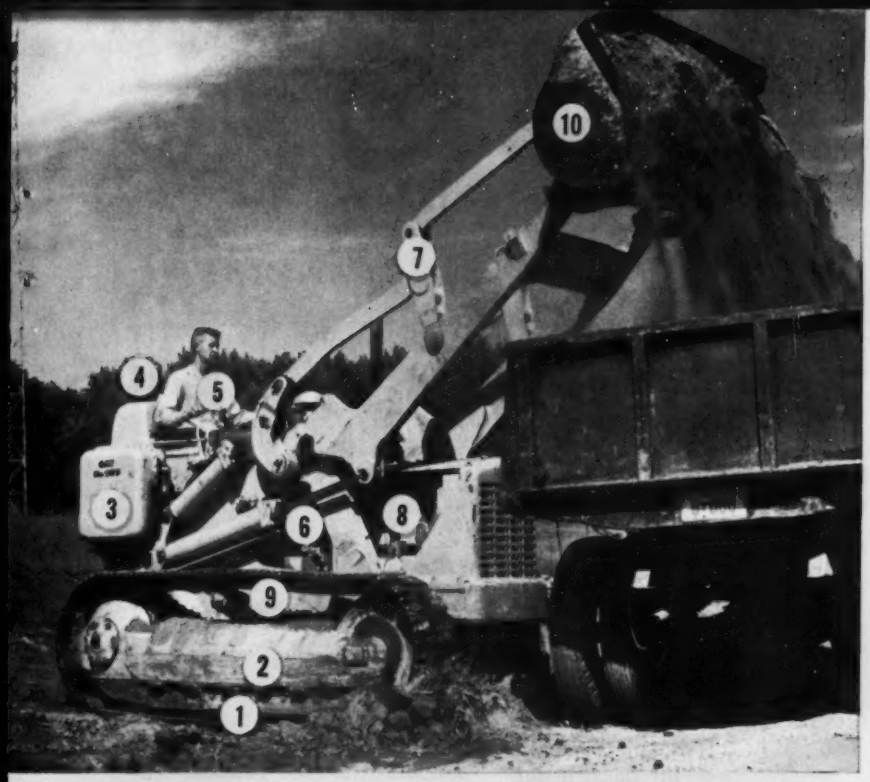
State Highway Contracting Plans for 1958

As reported to Construction Methods & Equipment in millions of dollars.

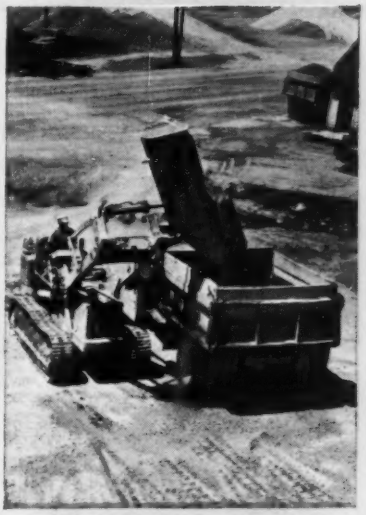
	Total Contracts			Interstate Only		"ABC" System (Federal-aid)		State Funds (no fed. aid)		Contract Maintenance		Machinery Purchases	
	Plans for 1958	Let in 1957	Change '57-'58 %	Plans for 1958	Let in 1957	Plans for 1958	Let in 1957	Plans for 1958	Let in 1957	Plans for 1958	Let in 1957	Plans for 1958	Bought in 1957
47 States* & D.C.	$4,632.9	$3,282.8	+ 41	.....	.....	.....	.....	.....	.....	$44.2	$45.9	$91.6	$105.3
46 States** & D.C.	4,232.9	2,992.3	+ 41	$2,051.2	$1,100.9	$1,660.8	$1,423.8	$520.7	$467.6	.....	.....	.....	.....
NEW ENGLAND													
Maine	23.0	15.1	+ 52	11.3	2.1	11.1	11.4	0.6	1.6	0.1	0.1	1.0	0.4
New Hampshire	27.0	19.0	+ 42	17.0	9.6	8.0	7.1	2.0	2.3	0	0	0.3	0.3
Massachusetts	140.0	68.0	+106	84.0	17.0	9.5	7.0	1.3	1.3	n.a.	n.a.	0.2	0.1
Vermont	29.8	14.6	+104	19.0	6.3	40.0	33.0	16.0	18.0	8.0	7.9	1.1	0.9
Rhode Island	25.0	11.5	+117	9.5	6.5	15.0	4.6	0.5	0.4	0	0	0.1	0.1
Connecticut	65.0	41.1	+ 58	10.0	19.7	47.0	17.2	8.0	4.2	0	0	2.0	1.2
MIDDLE ATLANTIC													
New York	290.0	279.7	+ 4	85.0	121.3	130.0	125.4	75.0	33.0	0.5	0.1	2.5	2.0
New Jersey	90.6	73.7	+ 23	41.4	35.0	33.0	22.5	16.2	16.2	0	0	0.3	0.3
Pennsylvania	250.0	173.9	+ 44	106.0‡	73.5	114.0‡	79.3	30.0	21.2	0	0	5.8	5.6
Maryland	68.0	45.9	+ 48	20.0	24.7	27.0	8.3	21.0	12.9	0.9	0.8	0.7	0.4
Dist. Columbia	27.1	13.3	+104	13.5	4.5	10.6	4.3	3.0	4.5	0.8	0.8	0.2	0.1
Delaware	19.0	9.0	+111	10.0	0.5	7.0	7.0	2.0	1.5	0.2	0.3	0.4	0.3
SOUTH													
Virginia	136.5	52.8	+158	93.5	11.0	40.0	38.7	3.0	3.1	5.0	4.7	2.0	2.0
W. Virginia	61.3	29.4	+109	45.0	0.9	16.3‡	28.5‡	...	n.a.	n.a.	11.5	1.5	2.0
No. Carolina	93.0	83.2	+ 12	58.0	37.6	28.0	36.1	7.0	9.5	0	0	2.3	3.2
So. Carolina	104.5	37.7	+177	57.0	5.2	42.5	21.5	5.0	11.0	2.5	2.3	0.8	0.6
Georgia	90.0	66.9	+ 34	20.0	3.5	37.0	28.7	33.0	34.8	0	0	1.5	1.6
Florida	125.0	93.6	+ 34	50.0	20.4	24.0	23.0	51.0	50.2	0.5	0.5	2.0	1.3
Alabama	30.5	39.0	- 22	17.5	5.6	11.0	28.9	2.0	4.4	n.a.	n.a.	1.0	1.1
Mississippi	58.1	57.2	+ 2	29.2	31.5	19.0	15.3	10.0	10.4	0	0	0.3	0.3
Louisiana	105.0	72.0	+ 46	50.0	25.0	35.0	27.0	20.0	20.0	0	0	1.5	1.5
Kentucky	90.5	39.9	+127	53.5	4.9	22.5	19.1	14.5	15.9	3.5	3.2	2.0	3.6
Tennessee	128.2	56.3	+128	80.2	9.0	31.0	30.7	17.0	16.5	n.a.	n.a.	1.0	1.0
MIDDLE WEST													
Ohio	400.0	290.5	+ 38	n.a.	175.8	n.a.	72.5	n.a.	42.2	1.5	2.0	30.0	50.0
Indiana	85.0	29.3	+190	47.0	0	35.0	25.3	3.0	4.0	0.2	0.2	3.0	2.5
Illinois	197.2	137.6	+ 43	108.5	69.8	82.9	56.7	5.8	11.1	3.4	3.3	1.7	1.7
Wisconsin	101.0	58.1	+ 74	50.0	10.6	40.0	36.7	11.0	10.7	0.5	0.6	0	0
Michigan	200.0	170.0	+ 18	74.0	56.0	70.0	64.0	56.0	50.0	2.5	2.5	1.1	0.7

*Excludes Arkansas for which figures were not reported. **Excludes Ohio which could not report breakdown of total and Arkansas. ‡Est by CM&E on the basis of '57 breakdown. ‡Incl. roads financed by state funds only; '57 incl. $20 mil. ABC roads

table continued on page 44



Caterpillar No. 955 Traxcavator works 10 hr. a day loading sandy loam into 6-yd. trucks for Brookings Excavating Co., Brookings, S. D. Two blocks of a street on the outskirts of town are being widened. Traxcavator is leveling bank. "One of the features we like best about it," says owner Lyle Stewart, "is the 40-degree tilt-back. It's especially useful tearing up old roads and sidewalks. You can get the bucket under a slab and use the tilt-back to tear up larger slabs at a time." This No. 955 is used for backfilling, too, and for digging basements, as well as for finish grading.



NOW AVAILABLE! NEW SIDE DUMP BUCKET!

Directly interchangeable with standard bucket . . . same pins, bolts, nuts. Easy to operate. Dumps to the left as well as forward. 1¾ cu. yd.

WHAT TO LOOK FOR WHEN YOUR CATERPILLAR DEALER DEMONSTRATES A No. 955 TRAXCAVATOR ON YOUR JOB

1. Notice the *triple-grouser* track shoes, designed specifically for this machine.
2. See the *5-roller track frame and larger idlers,* for better stability.
3. Check the *spool-type valves,* for smooth, positive bucket control.
4. Try the *padded seat made of foam rubber and raised* for good visibility.
5. Learn how convenient the *one-hand lift and bucket control levers* are.
6. Start the *all-weather gasoline starting engine*—so easy from the operator's seat.
7. Examine the *lift and bucket control arm linkage* —permits *40° tilt-back* at ground level.
8. Get the whole quality story behind the *CAT 70 HP Diesel Engine.*
9. Hear the amazing economy and convenience facts behind the *exclusive oil clutch.*
10. Watch the big 1½-*cu.-yd. bucket* in action (it's the widest part of the machine).

And this is *only the beginning* of your demonstration. Call your Caterpillar Dealer today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

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HARD-WORKING, LONG-LASTING LOADER VERSATILITY

STATE HIGHWAY CONTRACTORS PLANS FOR 1958 . . . continued	Interstate Only			Total Contracts		"ABC" System (Federal-aid)		State Funds (no fed. aid)		Contract Maintenance		Machinery Purchases	
	Plans for 1958	Let in 1957	Change '57-'58 %	Plans for 1958	Let in 1957	Plans for 1958	Let in 1957	Plans for 1958	Let in 1957	Plans for 1958	Let in 1957	Plans for 1958	Bought in 1957
WEST OF MISSISSIPPI													
Minnesota	81.0	51.4	+ 58	30.0	10.7	39.0	38.2	12.0	2.5	3.5	3.2	1.0	0.8
Iowa	136.1	93.6	+ 45	55.5	27.5	70.6	44.1	10.0	22.0	1.0	1.0	1.6	1.3
Missouri	100.2	76.6	+ 31	56.9	35.5	43.3	41.1	0	0	0	0	1.0	1.3
Arkansas	n.a.	45.1	.....	n.a.	28.5	n.a.	16.3	n.a.	0.3	0	0	n.a.	1.5
No. Dakota	51.1	26.3	+ 94	38.0	13.1	13.0	12.9	0.1	0.3	0.4	0.2	0.4	0.3
So. Dakota	45.3	24.0	+ 89	30.0	3.4	14.8	19.1	0.5	1.4	1.0	0.8	0.4	0
Nebraska	50.4	34.4	+ 46	21.0	5.8	29.0	28.6	0.4	0.1	1.2	1.1	0.8	0.7
Kansas	75.9	63.9	+ 19	40.0	21.4	30.9	37.5	5.0	4.9	2.5	2.3	1.1	1.0
Oklahoma	66.5	59.8	+ 11	32.0	28.1	33.0	30.9	1.5	0.8	0.5	3.1	1.5	1.1
Texas	250.0	223.6	+ 12	108.0	90.6	122.0	118.4	20.0	14.6	0	0	7.0	5.3
Montana	47.0	22.5	+109	27.5	2.9	19.5	19.6	0	0	0.4	0.5	0.4	0.7
Wyoming	41.3	41.3	0	28.0	28.0	13.3	13.3	0	0	0	0	0.7	0.6
Colorado	52.5	50.5	+ 4	22.3	21.3	24.1	23.6	6.1	5.6	0.7	0.7	0.8	0.8
New Mexico	45.0	48.8	- 8	25.0	27.0	19.0	19.8	1.0	2.0	0.1	0.1	0.6	0.6
FAR WEST													
Idaho	40.4	15.4	+162	30.0	2.0	10.0	13.3	0.4	0	1.1	1.3	0.6	0.5
Utah	40.3	16.2	+149	29.0	2.2	10.0	12.0	1.3	2.0	0	0	1.0	0.3
Arizona	26.0	20.7	+ 26	20.0	11.0	6.0	3.5	n.a.	6.2	0	0	0.5	0.5
Nevada	32.0	13.2	+142	22.0	2.6	10.0	10.6	0	0	0	0	0.8	0.8
Washington	65.9	45.9	+ 44	32.3	20.8	23.6	17.6	10.1	7.5	0.4	1.2	1.4	1.1
Oregon	55.0	40.0	+ 38	28.0	19.1	16.0	17.5	11.0	3.4	1.5	1.4	1.3	1.1
California	270.9	236.7	+ 14	115.7	116.3	127.5	94.9	27.6	25.5	0	0	3.0	3.0

Toll roads will provide about 40% less work in '58 than in '57.

Trying to Catch Up

Many states awarded less highway work in 1957 than the plans they reported in Construction Methods' survey a year ago. Actual interstate highway contract awards in 1957 fell $400 million short of plans because of delays in buying right-of-way, delays in designing the road, or other reasons.

The big increase in plans for this year obviously is intended to

continued on page 54

Construction Business cont. on p. 48

THE BIG THREE
'ROAD BUILDERS'
BMCO SELF PROPELLED ROLLER — All wheels oscillate on this exclusive BMCO design . . . giving more perfect compaction. Overloading of any one tire is impossible because all wheels act independently.
BMCO
SHEEPSFOOT ROLLER
BMCO SHEEPSFOOT ROLLER
Especially designed to tamp faster, walk out more quickly and clean better with less required drawbar pull. The frame will not pull apart. Available in single, double and triple drum models.
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BMCO 50 TON COMPACTOR — Greater ballast capacity assures maximum compaction and a FULL 50 TONS, as well as giving more space for shifting ballast load to regulate drawbar pressure. Interchangeable tongue means any towing unit can be used.
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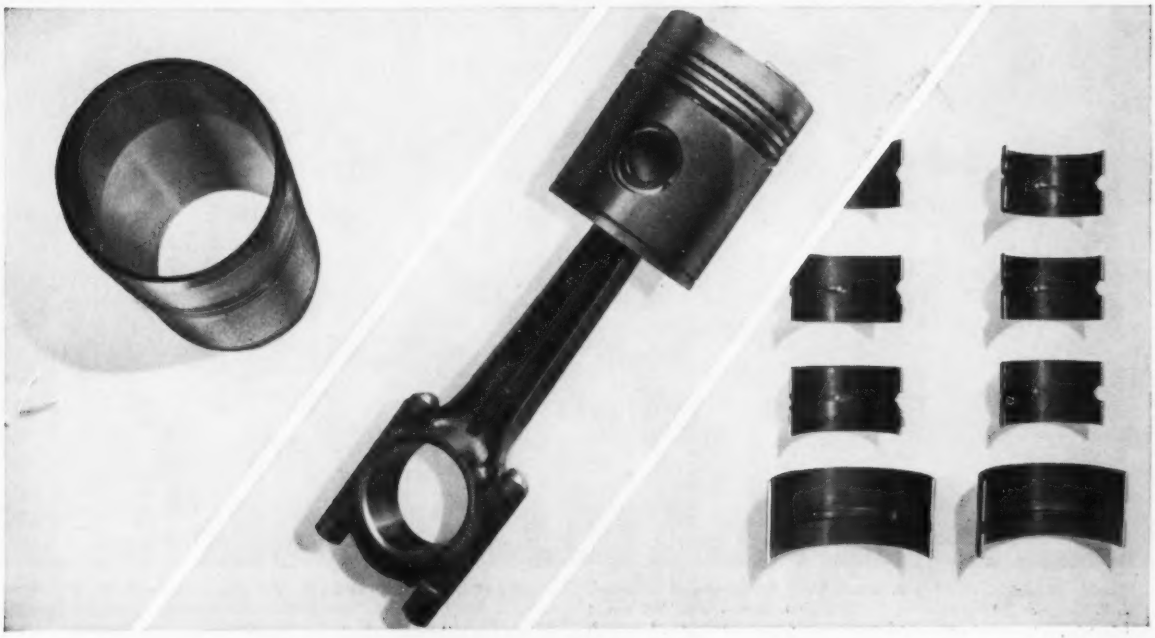
The Engineer's Field Report

CASE HISTORY
RPM Delo Oils
LUBRICANT
Progressive Transportation Co, Compton, California
FIRM

RPM DELO holds piston wear to .001" after 201,253 miles of on-and-off highway hauling



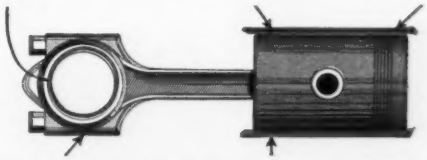
LUBRICATED WITH RPM DELO Oil, these engine parts were pulled from a Cummins HR diesel after 201,253 miles. A portion of this mileage was put on during four months of rugged service spotting loads of heavy pipe in the Arizona desert. When the engine was taken down, after two years of this on- and off-highway hauling, Progressive Transportation Co. found RPM DELO Oil had kept lacquer, gum, sludge, and deposits from forming...rod bearing wear varied between .0005 and .001 inch and pistons showed maximum wear of only .001". No wear at all evident on main bearings. Progressive Transportation uses RPM DELO Oils in all its large fleet of tractors—some of which have traveled well over 200,000 miles without overhaul.

Why RPM DELO Oils prolong engine life

Special compounds stop corrosion

Anti-oxidant resists lacquer formation

Detergent keeps all parts clean



Metal-adhesion qualities keep oil on parts in running or idle engines—inhibitor resists foaming

LUBRICATING OILS RPM DELO

For More Information... about this or other petroleum products of any kind, or the name of your nearest distributor, write or call any of the companies below.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • **STANDARD OIL COMPANY OF TEXAS**, El Paso
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • **THE CALIFORNIA COMPANY**, Denver 1, Colorado

Outside Camarillo, Calif., U. S. 101 is being relocated and improved. J. E. Haddock Ltd. is handling 5-mile project, moving a million and a half cu. yd. — mostly rock. Haddock moves about 7,000 cu. yd. a day.

Four CAT D9 Tractors are on the job here, along with five D8s, three No. 12 Motor Graders, three DW21s with Scrapers, three DW21s with Athey PR21 Wagons, and a D13000 Caterpillar Diesel Engine.

Two of the three Caterpillar DW21 Tractors with Athey PR21 Wagons loading up for another fast rock haul on U. S. 101 project. Conditions like this explain why Project Supt. Saul says he picked Caterpillar for its "ability to do the tough work."

Athey PR21, teammate of DW21 Tractor, can haul 34 tons of rock or other material efficiently. On this job it hauls about 18 cu. yd., making 1-mile round trip in about 12 minutes—against a return grade of 12% in places.

RELOCATING U. S. 101

"This job is plenty tough. We called on Caterpillar-built equipment for this one. We get good service with very little down time—and then our Caterpillar Dealer goes all out to see that our machines are back at work as soon as possible."

Project Supt. Neal Saul's words should ring a bell for you, too. See *your* dealer for the machines that handle the tough jobs in stride. See him for replacement parts you can trust. See him for the fast, thorough service that keeps your machines making money.

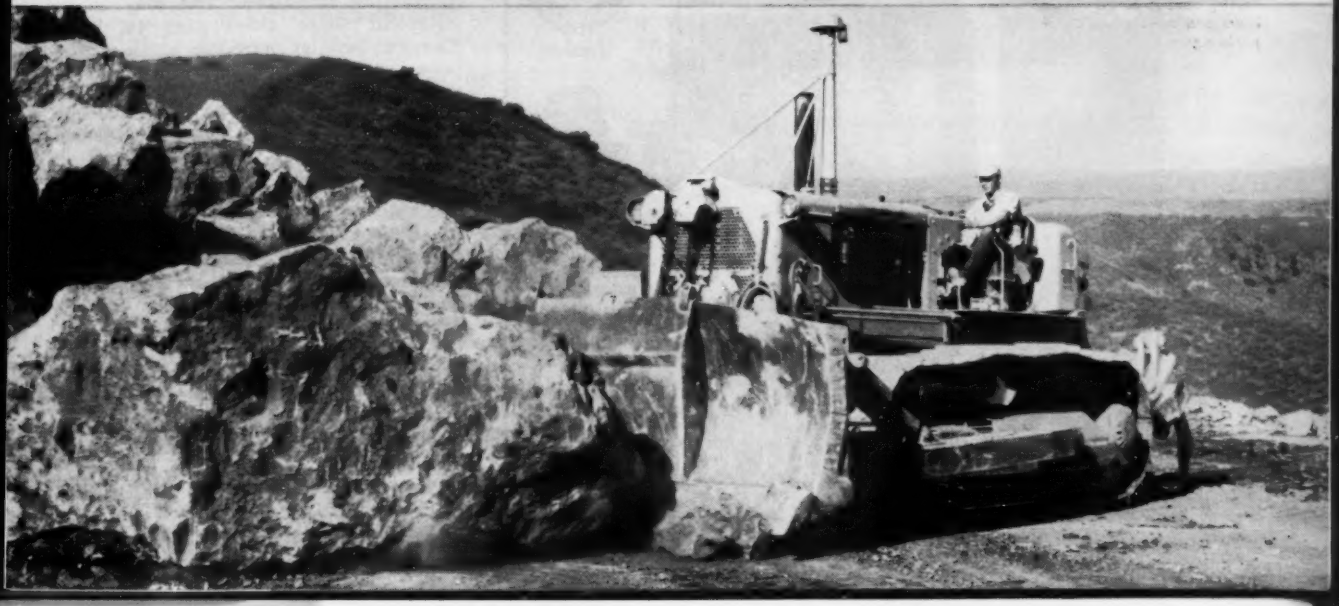
Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WHEN THE JOB IS PLENTY TOUGH

D9 with No. 9S Bulldozer moves rock in a hurry. The LOAD SHAPE No. 9S is a 14-ft. blade with a cutting edge made of "Hi-Electro" hardened steel. A push cup mounts easily, right onto the blade, when desired. The D9 delivers 320 HP at the flywheel. With its optional three-stage torque converter, the D9's output is automatically matched to the load.



Business Picks Up During First Quarter

The end of the 18 months slide in heavy construction contracts was reached in December. Since then, contractors' new business has increased. Starting with a modest upturn in January, awards reported by Construction Methods spurted in February and again in March.

This new strength in the contract trend trimmed the gap between this year and last. The month of March was only 5% below March, 1957. But January awards were 24% below a year ago, and February dipped 21%.

During the first three months of 1958, heavy construction contractors took on $3,831 million of new projects. Though this is 16% under 1957 and 32% under the record first quarter in 1956, it compares favorably with the first quarters of other years. Moreover, it's 45% higher than the first three months of 1954, which was the low point of the short-lived 1953-54 "recession" in heavy construction contracts.

Most of the 1957-1958 decline centers in federal contracts, down 40%, and private awards, off 18%. By contrast, state and local public works volume is only 3% under a year ago—a gap that soon will be wiped out when public awards hit full stride in the April-June period.

A few types of work are running ahead of a year ago. Sewerage, public housing, other public building, and private commercial building contracts top the first quarter of 1957 by 6% to 54%. Other major types of heavy construction are behind.

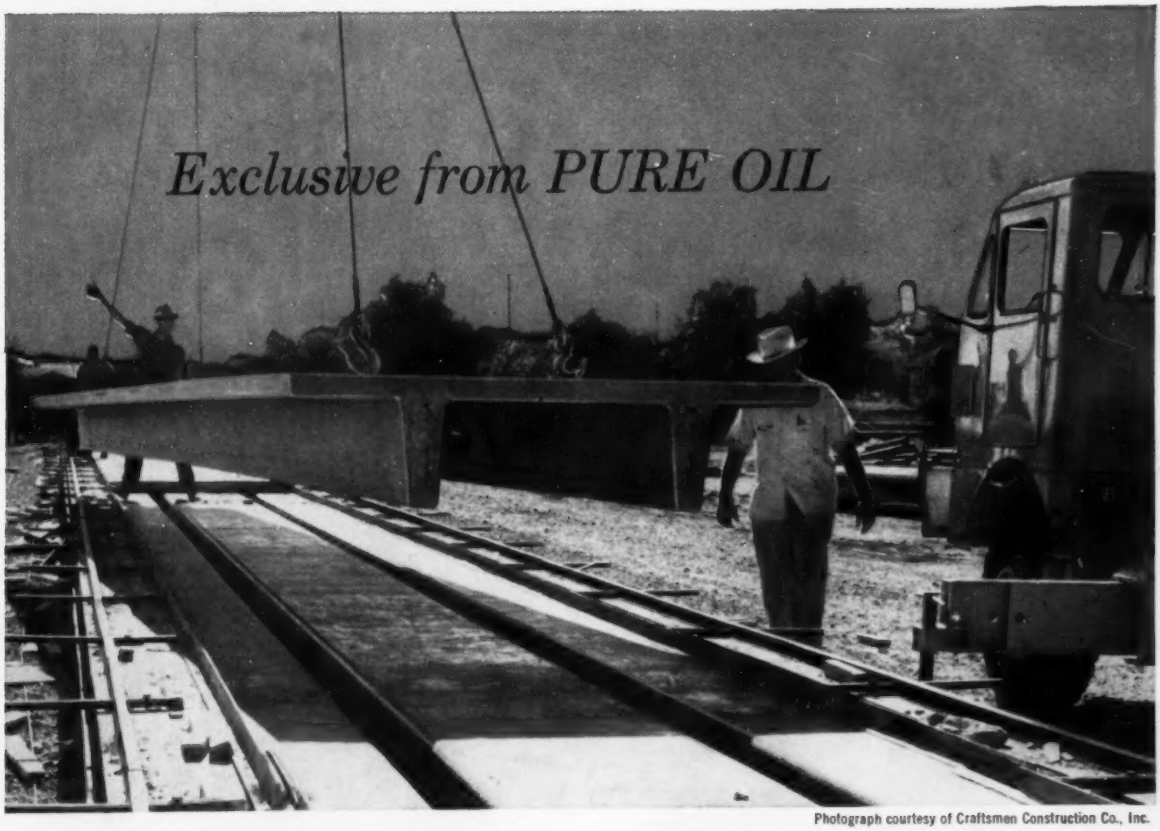
However, contracts in the next nine months are expected to top the corresponding total awarded in 1957 so the grand total for this year will trail last year by only about 2%.

State, Municipal Help

The burden will be on state and municipal work to pull contracts ahead of the year-ago pace during the balance of the year. State highway departments' plans for letting awards this year indicate a big rise in highway projects. Moreover, more work also will be coming along at the municipal level, according to the Construction Methods' survey that showed nearly all of 60 cities intending to maintain or speed up contracting schedules. The majority of these cities plan to award at least as much work this year as last, and several indicate they plan to let a larger volume of contracts this year.

There are signs that the private construction market is firming up, particularly commercial building and housing. The signal flags are the figures for projects entering the planning stage because they represent future contract awards. The trend in proposed new commercial and housing projects turned upward in the first quarter, but the contract trend remained down. The contract trend should reverse itself later on as projects move through the planning stage to contract.

lower initial cost
lower service cost
Compare and you will see the ROOSA MASTER fuel injection pump costs less. Use it and you will see that your service costs less. There are fewer parts to service and repair because of the unique design of ROOSA MASTER. It takes less space on your engine, and weighs less than 10 pounds. Even though small in size and light in weight one size serves either a 2, 3, 4, 6 or 8 cylinder engine.
HMS
ROOSA MASTER
makes good diesels better
HARTFORD MACHINE SCREW CO., HARTFORD 2, CONN.
DIVISION OF STANDARD SCREW COMPANY
The result of 37 years of engineering development is proven in hours and miles of outstanding performance.
ASSOCIATION DIESEL SPECIALISTS A·D·S
Member
YOU CAN DEPEND ON THE DIESEL THAT DEPENDS ON ROOSA MASTER



Photograph courtesy of Craftsmen Construction Co., Inc.

smooth concrete surfaces for only 1/10¢ per square foot

POCO SOLUBLE COMPOUND

Sales increase of 1400% in two years—Proof of its acceptance

Now there's a form-parting lubricant that gives you glass-smooth, bubble-free surfaces in your pre-stressed and precast concrete beams and channels.

It's **POCO SOLUBLE COMPOUND,** exclusive with The Pure Oil Company.

It's the only way to get smooth surfaces on all your concrete work . . . at a cost of only about 1/10¢ per square foot.

Just mix POCO SOLUBLE COMPOUND with water and spray on your forms. (Or you can brush or swab it on.) You'll find the forms strip away quickly, easily, cleanly, leaving a smooth surface without blowholes or pinholes. No rust stains from the form will be left on the finished surface. And the oil film left on metal forms gives you added protection against rust.

Ask your local Pure Oil representative for further information on POCO SOLUBLE COMPOUND. He'll tell you the correct mixture for *your* operation and show how POCO SOLUBLE COMPOUND can cut your costs and improve the appearance and salability of your concrete products.

PURE

MORE AND MORE THERE'S ALWAYS A GOOD REASON YOU CAN BE SURE WITH PURE

6 YARDS

A ten or twelve yard tandem-axle truck loaded in 60 seconds!

***Two* 23-ton semis heaped in three or four minutes!**

***Two* passes for the smaller truck, five for the two bigger ones *combined*.**

Someone's dream? Not any more! It's been standard practice at Stony Creek Stone Company's pit near Indianapolis ever since last summer. That's when their big *6 yard* Model 375A Michigan Tractor Shovel went to work.

Big production cuts costs, reduces truck waiting time

Stony Creek's problem up until then had been a common one: "How to hold down loading costs, and reduce truck waiting time in the face of rapidly-expanding customer demands." Fast rubber-tired Tractor Shovels had long since replaced cranes and crawler-loaders. The biggest rubber-tired units available, 2¼ yds, were in use. But, production requirements were calling for still more loading capacity. At that point, Company General Manager Dick Irving got a big idea. Visiting the Clark booth at the Road Show, he saw the new 6 yard Model 375A Michigan. "There," he thought, "is a Tractor Shovel that could *really* do a job for us. It could give us enough capacity to replace two smaller Tractor Shovels *plus* handle all the expansion we anticipate for years to come."

Michigan output totals 2,500 tons daily

Today, the big Michigan and its *one* operator do the work of two or more smaller Tractor Shovels. Michigan output averages 2,500 to 3,000 tons of crushed limestone every day. "Despite its size, I'd rather run this big Tractor Shovel than any other," says Operator Carroll White. "It handles easily. It moves and responds just as fast as any smaller loader. Its big low-pressure tires really absorb the bumps. And its smooth ride sure cuts down on the fatigue you'd expect from a 10-hour day—even though I alone load as much stone as two men

(Advertisement)

Notice how much this big new Michigan *looks* like the smaller Michigans you see everywhere. It handles as easily as they do, too—with power steer, power-shift, torque converter, planetary wheel drive-axles standard. Its entire all-Clark power train is the same design as that job-proved in the 8,000 Michigans now in the field.

Specifications	Model 375A	Model 275A
Bucket capacity (standard SAE ratings)	6 yards	4 yards
Lifting capacity	30,000 lbs.	22,000 lbs.
Weight	61,000 lbs.	45,000 lbs.
Speeds (forward and reverse)	0-25 mph	0-28 mph

PER PASS

did when the pair of 2¼ yard rubber-tired Tractor Shovels were working."

Five passes heap two semis

And that's another reason White prefers the 375A. Higher production! With the smaller machine, White needed at least four minutes and eight passes to load one 23-ton haul truck. With the Model 375A, White regularly loads *two* 23-ton semis in the same time or less—in only 2½ passes each. Two-and-a-half passes? Yes, White does it like this: Two heaped loads go into the truck. On the third load, precise hydraulic controls let White hold bucket so that only half its load is dumped. That fills one truck. The other half-load is fed into the second truck. Then, two more full loads sends this truck on its way too. Thus: five passes, two truck-loads.

Efficiently loads small trucks, too

White even prefers to load a *five-yard truck* with the 6-yard Michigan. Here, the Tractor Shovel bucket is allowed to extend beyond the back end of the truck when dumping. May *sound* wasteful, but before the loaded truck can shift into second, one quick swipe of the Model 375A bucket has cleaned all spillage.

Model 375A easy to maintain

White feels the big Model 375A is as easy to run as *any* Michigan Tractor Shovel—perhaps even a little easier because of its greater weight and better stability. The new Tractor Shovel is easy to take care of, too. In only 10 minutes each morning, White makes his daily maintenance check. Proper care, plus rugged construction, have held repairs to virtually nothing. In the many months Stony Creek has had the Model 375A, there has been *no maintenance at all* on the job-proved Clark power train.

Clark distributors are ready to *show you* this big new dependable 6 yard Michigan, as well as the new almost-as-big 4 yard Model 275A. Call to arrange a date.

Michigan is a registered trade-mark of

CLARK EQUIPMENT COMPANY

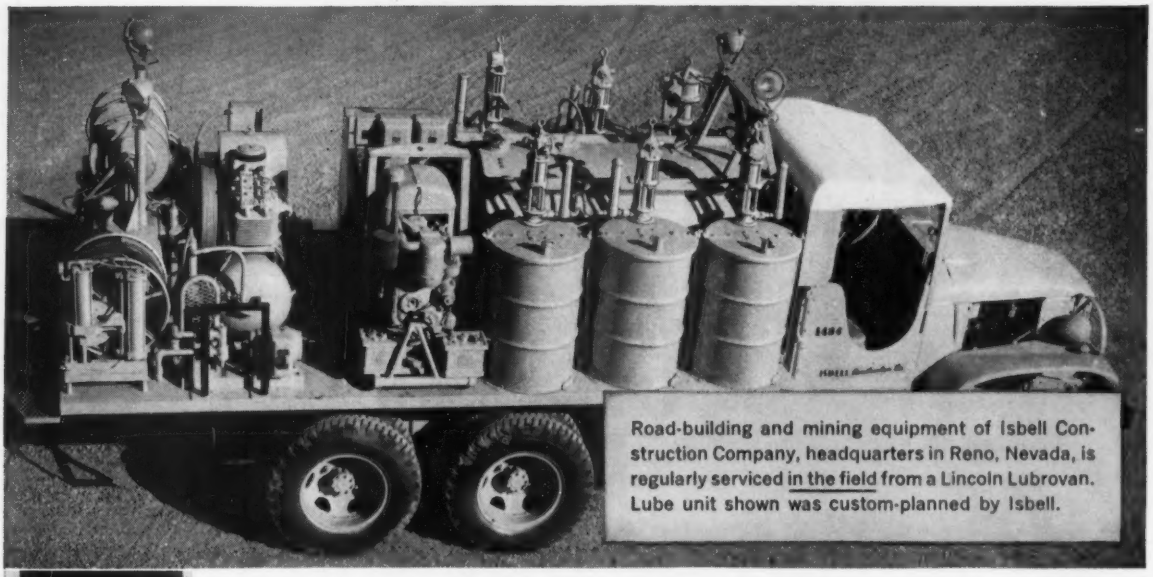
Construction Machinery Division
2403 Pipestone Road
Benton Harbor 10, Michigan
In Canada: Canadian Clark, Ltd., St. Thomas, Ontario

CLARK® EQUIPMENT

Maintenance-minded Isbell Construction Co.

lubricates on the job, guards against breakdowns

with the *Lincoln Lubrovan**



Road-building and mining equipment of Isbell Construction Company, headquarters in Reno, Nevada, is regularly serviced in the field from a Lincoln Lubrovan. Lube unit shown was custom-planned by Isbell.

Pioneers in open pit mining, the Isbell Construction Company has supervised movement of over a quarter-billion tons of ore and waste material in the West during the last ten years. View shows, left to right, Lester Bell, Harry Hanish, Al Isbell and Glenn Stegall. Hanish and Stegall are with Colyear Motor Sales who sold the Lubrovan.

Protect job profits... cut cost per yard

Isbell is typical of the many heavy construction contractors, coast-to-coast, who use Lincoln Lubrovans to guard against equipment breakdowns and unnecessary parts replacements . . . cut cost per yard . . . and extend working-life of equipment.

Portable Lubrovans provide positive, dependable maintenance, keep your equipment steadily, *profitably* at work. Available in a number of standard groups . . . or, if you prefer, custom-plan your own Lincoln Lubrovan from easy-to-assemble standard components to meet specific job requirements.

We'll be happy to demonstrate, right *in the field* how Lubrovans protect your job profits. Call us now!

*Trade Name Registered

Lincoln

LINCOLN ENGINEERING COMPANY
Division of The McNeil Machine & Engineering Co.
5702-75 Natural Bridge Avenue • St. Louis 20, Missouri

Dozes rock, spreads gravel, pulls compactor on scattered sections of Turnpike contract

"Mobility—that's one of the best things about THIS Tractor Dozer"

Poirier & McLane Corporation's Michigan Model 180 Tractor Dozer is able to reach every part of their 3-mile contract section on the Connecticut Turnpike in a matter of minutes, and it successfully tackles almost any job when it gets there.

Goes anywhere up to 27 mph

Operator Winfield "Wimpy" Jellison says, "The Michigan is easy to handle—almost like driving a car. It travels all over different parts of our job every day. If it didn't have rubber tires, there'd be big, costly delays for almost every move. But with the Michigan, I can be on an emergency job 5,000 feet away in just a few minutes.

"Sometimes, while waiting for haul trucks to unload," Operator Jellison continues, "I run over to ledge rock not yet rough-leveled, move 10 to 15-ton boulders out of the way, or fill in low spots. Or if I stay on the gravel sub-base, I fine-grade by running in reverse and back-blading with the back edge of the dozer blade."

Handles many jobs besides basic dozing and grading

In its half-season on the $14,000,000 contract, the 165 hp Michigan also has righted an overturned trailer . . . pulled a wobble-wheel compactor . . . dug up roots and stumps . . . dozed out rock outcroppings . . backfilled around hard-to-get-at abutments for one ¼-mile-long viaduct and 11 overpasses. It has worked frequently in shot rock along the right-of-way, trimming high spots, chipping rough edges, shoving excess rock and boulders into hollows. When an area is close to final grade, gravel fill is hauled in by 15-yard dump trucks, unloaded on the rock shelf, and spread by the Michigan in 6" lifts.

Spreads 1800 yards daily

Larry Bussell, grade superintendent, says, "Our grading contract is right on schedule. The Michigan helps keep us there. It spreads fill from 10 to 12 trucks —each making a dozen trips in a 10-hour day. That means the rubber-tired dozer handles about 1,800 cubic yards daily, besides doing a host of odd jobs."

Find out how this speed and versatility could pay off for you. Your local Michigan distributor will be glad to give you a demonstration of Michigan's mobility, pushing power, *and dependability*. You pick the time and place.

CLARK EQUIPMENT COMPANY
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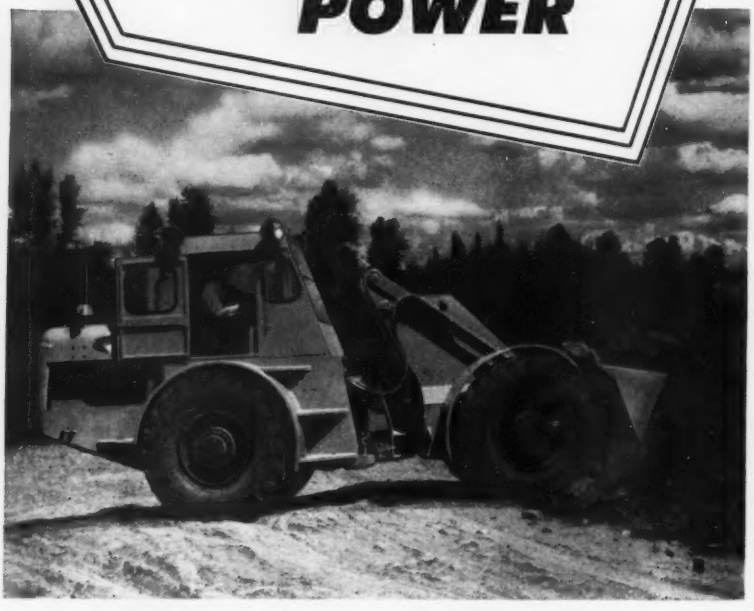
(Advertisement)

LOADING SHOT ROCK takes EXTRA POWER



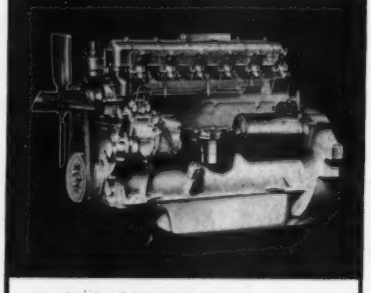
SCOOPMOBILE does it easily with

WAUKESHA Diesel

● Tough stuff to load—that shot rock! Takes a real loader with an engine that can pour on the power. With its Waukesha Diesel, and 100% breakout bucket action, this 1½ cu. yd. LD 5P Scoopmobile handles a lot of yardage for Bowman Sand & Gravel Co., Albany, Oregon —steadily, smoothly, quickly. Four-wheel planetary drive gives power to spare. Power steering, power shift forward and reverse transmission, and 4-wheel power brakes lighten the work of the operator. Waukesha Diesels also give you easy starting, quick warm-up, snappy acceleration, with high fuel economy and most economical upkeep.

372

POWERING the SCOOPMOBILE



Waukesha 190-DLC Diesel—Six cylinders, 3¾ x 4-inch, 265 cubic inch displacement. Send for descriptive bulletin 1411.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES

CONSTRUCTION BUSINESS . . .

continued from page 44

help the states "catch up" to their goals for interstate highway construction. Whether they all can reach the targets reported to Construction Methods depends greatly on overcoming some of the same bottlenecks that cramped progress in 1957. Right-of-way acquisition, for example, will be a major problem to be licked in 1958, say 38 states.

Withdrawals from the Highway Trust Fund are bumping against the "ceiling" rate based on funds provided for interstate projects by the 1956 Highway Act. But the Gore Bill, passed two weeks ago, authorizes additional highway funds for fiscal '58, '59, '60 and '61 which will go far to fill the gap.

- Interstate system — $200 million extra for '59 to be allocated immediately ($2.2 billion previously authorized for '59); $2.5 billion for fiscal 1960 to be allocated July 1, '58 (only $1.6 billion would have been available from trust fund); $2.5 billion for fiscal 1961 (only $1.2 billion lion would have been available from trust fund).
- ABC system — $400 million extra for fiscal '58 to be allocated immediately ($875 million previously authorized for '58 and '59); $900 million for fiscal 1960 to be allocated July 1, '58; $925 million for fiscal 1961 to be allocated July 1, 1960.

Contract Maintenance

Spending for maintenance of state highways will rise 3% in 1958, but the states will cut back contract maintenance slightly and increase force-account work.

Though total contract maintenance reported is less than last year, 18 states will let more of this type of work in 1958. Only 8 states plan to cut down contract maintenance; one state plans the same volume as last year.

Construction and maintenance machinery purchases scheduled for 1958 will drop about 13% below 1957. The 42 reporting states plan to buy $91.6 million of machines this year. A sharp $20,000,000 drop in machinery buying by Ohio's highway department accounts for most of the over-all decline. By contrast, 26 states plan increased machinery budgets for 1958. Only 10 states will reduce machinery outlays, and 6 will hold to the 1957 spending level.

(Advertisement)

Twenty five ton lifting capacity!
Handles easily . . . fast on the highway . . . and

STRIPS QUICKLY, EASILY TO MEET HIGHWAY WEIGHT LIMITATIONS

"These are the four main reasons we bought our new 25-ton Michigan Truck Crane," says Pete Smith, Secretary of Emmerson Truck & Storage Company, Battle Creek, Michigan . . . "and the four main reasons we like it so much today. Results of the past eight months of work certainly justify our selection!"

Reaches for the sky—or into a building

Photo illustrates one of the "results." Here, with 85 ft boom and 15 ft jib, Emmerson lowered an old 2½-ton (8′ high, 3′ wide) commercial blower from the roof of Kellogg's Battle Creek plant. Entire assignment took just a few hours, including time for the Michigan Crane to drive 3 miles through town to the world-famous cereal factory *and* time to transport the blower to Kellogg's yard several blocks away. *Cramped quarters,* on the other hand, have proved equally accessible. With a very short boom-end (made in the Emmerson shop) to reduce boom length to 17 ft, the Michigan sets machinery *inside* plant buildings. Negotiating doors as small as 8½ ft wide by 12 ft high, the Michigan drives right in where many 25-ton cranes can't go.

Handles 3-ton horizontal lifts in muck

Another "toughie" the Michigan took in stride was the laying of new 12″ gas main under a new river channel. Here, the boom was used *absolutely horizontal*—45 feet out—while the Michigan maneuvered 3-ton pipe sections into place. *Biggest* load lifted to date was a 25-ton press. *Highest* loads have been 5,000 lb buckets of concrete—100 feet up! Some of the *hardest* have been in ankle-deep mud . . . setting huge roof joists, for example. Even at night, with boom flood-lit by portable chassis-mounted generator, Emmerson has set transformers and regulators for Consumers Power & Light Co.

"Performs beyond expectations; not one complaint!"—President

"We're very pleased with our Model T-24 Truck Crane," says Bob Sergeant, President and General Manager of Emmerson. "It's performed beyond our expectations; we haven't one complaint. This Michigan has done everything the manufacturer said it would—*and more!*"

Why don't YOU look into the advantages of a Michigan Truck Crane? Write for new illustrated booklet on the Model T-24 25 Ton Truck Crane. Get the facts, today!

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Construction Machinery Division
2403 Pipestone Road
Benton Harbor 38, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario

CLARK® EQUIPMENT

CONVENTIONAL TRANSMISSION

EATON 2-SPEED AXLE

This Combination can Save Hundreds of Dollars on Investment and Hauling Costs!

It's the BEST and LOWEST COST Combination Providing 8 or 10 Forward Speeds

- Lower total weight—permits handling as much as 200 pounds additional payload
- Permits shorter tractor wheel base
- Simple, easier shifting
- Lower maintenance cost
- Lower original cost

EATON 2-SPEED AXLES

More than Two Million Eaton Axles in Trucks Today. For complete information, see your truck dealer.

EATON AXLE DIVISION MANUFACTURING COMPANY CLEVELAND, OHIO

PICTURE OF THE MONTH

Production Line Concreting

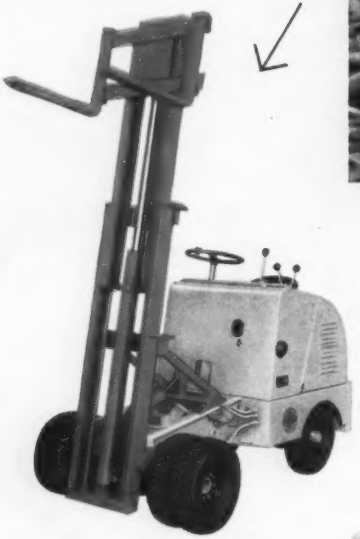
• Lining the penstock tunnels at Swift Dam on the Lewis River in Washington is a highly mechanized operation. Dumpcrete truck feeds conveyor that delivers mix to Pumpcrete machine for placing between the steel liner and the rock walls of the tunnel. Steel cylinders (right), lined up on rails in front of the No. 3 penstock tunnel, await placement of reinforcing steel. J. A. Jones Construction Co. of Charlotte, N.C., and Charles H. Tompkins Co. of Washington, D.C., are general contractor for the Pacific Power & Light Co. project.

NOW!

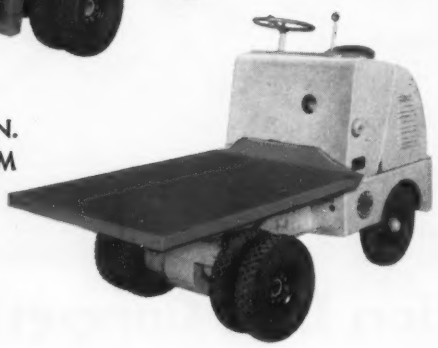
3000-LB. LOAD CAPACITY

in NEW R-18 Moto-Bug®

(Does your lifting too)



7-FOOT FORK LIFT ATTACHMENT



42 x 54-IN. PLATFORM

Looking for a low-cost answer to your material-handling? Then check the big load-carrying capacity, and all-around versatility of this new Kwik-Mix R-18 Moto-Bug. As a power-wheelbarrow (above), it hauls up to 3000 pounds in 18 cu. ft. gravity-dump hopper (special tailgate body optional).

Quick change from hopper to other attachments *triples* the R-18's usefulness on every job. Switch to 42 x 54-in. platform, and you have a heavy-duty 1½-ton flatbed truck. When there's heavy lifting to be done, 7-foot fork lift attachment handles up to 1500 pounds (at 15-in load center). Ready to pour some concrete, or haul supplies? Just change back to hopper body — it's as simple as that, with *multi-tiple tool* Moto-Bug on the job! (5-foot blade, towing hitch also available — has 780-lbs. drawbar pull for towing wagons, carts).

The R-18 climbs 25% ramps or grades fully loaded — travels at speeds up to 12 m.p.h., forward and reverse. There's *no clutching — no shifting.* Learn how Moto-Bug can save time and dollars on your jobs. Ask Kwik-Mix distributor for a demonstration on your job. Call him *today* or mail coupon.

KWIK-MIX Company, Part Washington, Wis.

Send literature on: ☐ *3000-lb. R-18 Moto-Bug* ☐ *1500-lb. S-10 Moto-Bug*

NAME..... TITLE.....

COMPANY.....

STREET.....

CITY, STATE.....

KM809 CME

KWIK-MIX® MOTO-BUG®

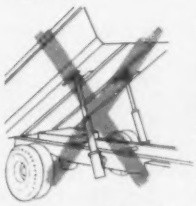
A division of Koehring Company

Other Kwik-Mix products: CONCRETE • PLASTER-MORTAR • BITUMINOUS MIXERS

Output increased 9%

What's the dumping time of your hauling units — 15, 20, 25 seconds? Right there is where you can save time, get more trips an hour by dumping in *one second* with Koehring® 6-yard Dumptor®. It has no slow-acting mechanical hoist. Operator trips the body-release lever, and *gravity* tilts the body 70°. One second later the load is out, and Dumptor is on its way back for the next load.

This adds up to a substantial increase in extra yards hauled per hour. For instance, take a typical 1,000-foot haul where an ordinary dump truck would make 16 trips an hour. Allowing the same time to load, haul and return, Koehring Dumptor would average 17½ trips on the same cycle. That's because one-second dumping cuts 20 seconds off cycle time — gains a total of 320 seconds, or 5.3 minutes more productive time per hour — gives you 17½ trips, instead of 16. This, alone, adds 9% to hourly yardage output with Koehring Dumptor. But that's not all —



No body-hoist maintenance

There are no expensive body-hoist replacement parts, no hoist maintenance or down-time delays, because *gravity-dump* never balks, never wears out. You get the same one-second dumping *every time.* What's more — Dumptor has no springs — just one big snubber type shock absorber on steering axle. Big shock absorbing tires eliminate the need for springs on the drive axle. No springs — *no spring maintenance!*

Add up *your* dump-time, body-hoist and spring-maintenance costs — see for yourself how much you can save by hauling with Koehring heavy-duty Dumptors. Check too, how *no-turn* shuttle-hauling cuts another 15 to 30 seconds off cycle time. Call Koehring distributor about it *today* — or write for new catalog.

KOEHRING DIVISION of Koehring Company, Milwaukee 16, Wisconsin

KOEHRING® DUMPTOR®

K813

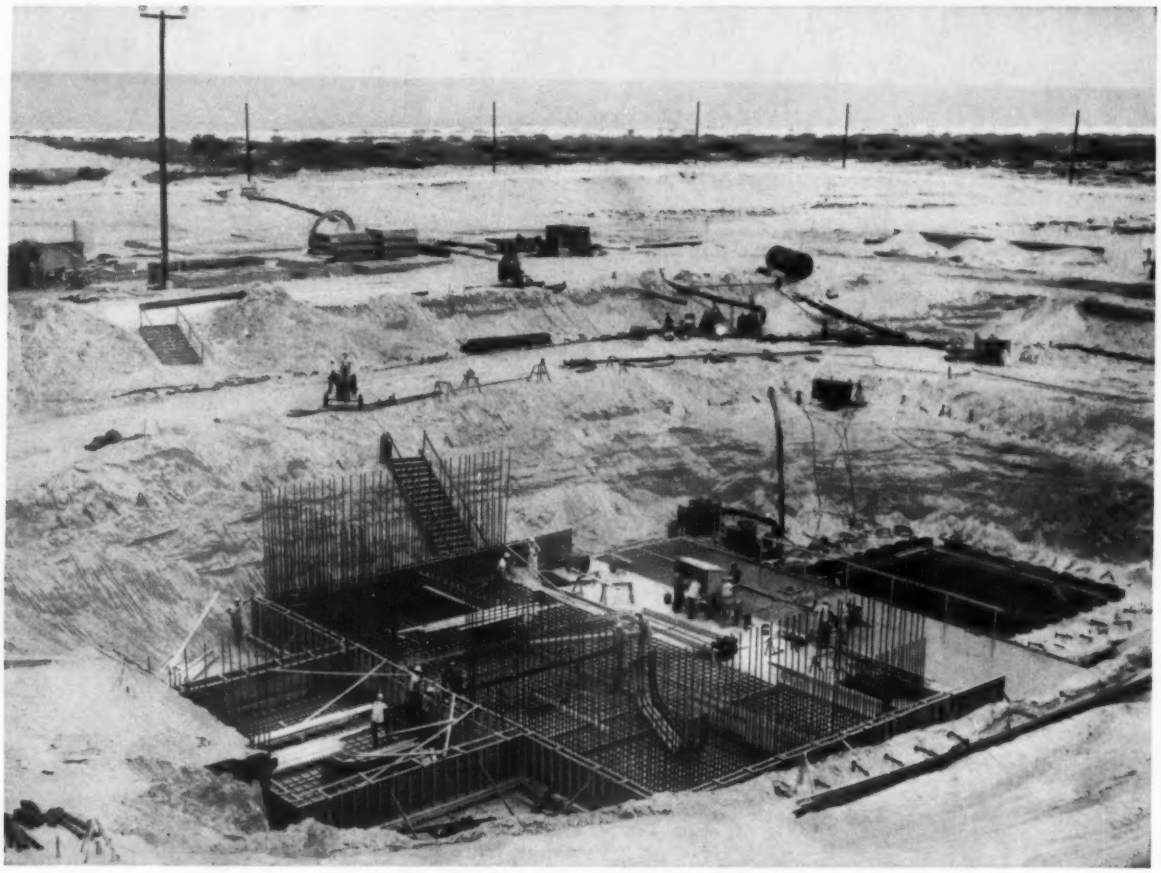
EXCAVATORS • CRANES • *twinbatch*® PAVERS • FINISHERS • MUD-JACK®

HOW TO HANDLE

WET JOBS

#41 of a Series

Project: Launching facilities, Cocoa Beach, Fla.
Engineering and supervision of construction: Loewy-Hydropress, Div. Baldwin-Lima-Hamilton Corporation, New York, N. Y.
Contractor: R. E. Clarson, St. Petersburg, Fla.
Pumping Contractor: WELLPOINT DEWATERING CORP., NEW YORK, N. Y.



Wellpoints lower 45 ft of ground water, relieve hydrostatic pressure, as...

Dewatering Speeds Progress at Cape Canaveral

Speed was urgent on this guided missile launching site. Confronted with numerous construction problems, the contractor decided to sublet his difficult dewatering operation.

• **The engineers' specifications** called for the launching pit to rest on a clay stratum 53 ft below ground surface that had water-bearing sand above and below it. So that no disturbance of this clay stratum would occur due to unbalanced hydrostatic pressure, a dewatering system was specified.

• **Solution: Griffin** engineers designed a 3-stage pressure-relief and dewatering system that successfully relieved 45 ft of hydrostatic pressure while also lowering 45 ft of water in the launching pit and dewatering the overall construction area to a depth of 20 ft . . . all this done in record time, dependably, economically, by Griffin.

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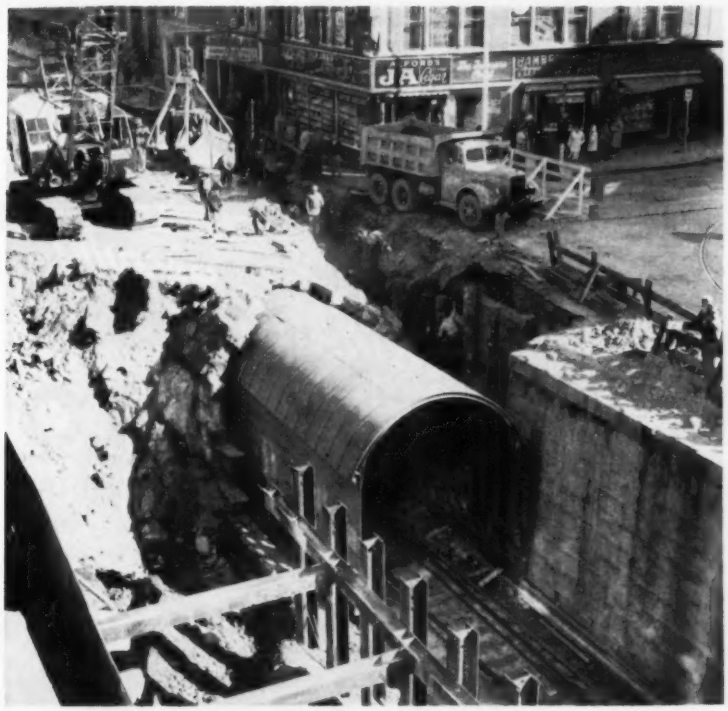
Construction News in Pictures...



Keeps Tracks Clear

A steel shield that rides on rails enables Farina Bros., Inc., to demolish an old granite block tunnel in Salem, Mass., without interrupting railroad traffic. Demolition of the 700-ft-long tunnel is part of Farina's $5.5-million contract for construction of a 1,900-ft railroad relocation in the business section.

Flying Concrete Buggy

Workmen get set to pull cord that will dump concrete from ½-yd bucket airlifted to site by helicopter. In about 20 min, the helicopter brought in enough concrete to pour four footings for a Southern California Edison Co. transmission tower high in the mountains. It also transported men and equipment to the hard-to-reach site.

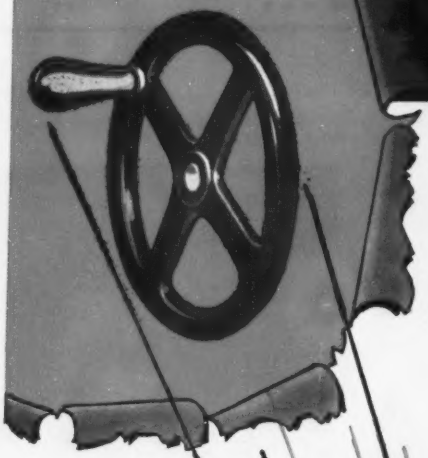
◀

Big, Heavy, and Fast

This self-propelled, double-drum roller does the work of three tractor-pulled rollers for Mittry Construction Co. on the Vaquero Dam Project near Santa Maria, Calif. It is powered by two 200-hp General Motors diesels with torque converters. It can move in either direction at a speed of 8 mph. With ballast the rig weighs 100,000 lb.

continued on page 64

NO HEAD ANGLE ADJUSTMENTS TO MAKE WITH...



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another big step ahead... **the Blaw-Knox EXPRESS Paver**

Here is the newest model of the world's most advanced Bituminous Paver. It is designed to bring contractors all over America bigger profits through improved, more automatic operation.

Better Finishing

New one-piece screed of abrasion-resistant alloy steel provides smoother finishing. Brand new screed extensions install faster. Big cam-type adjustment bolts eliminate shimming, give you a true line surface up to sixteen feet. Two screed heaters are standard on the Express Paver for faster heat-up, more even heat distribution. Positive and negative crowns adjustments are made from a turn buckle-type adjustment nut above the screed. Planing adjustment point is located *at the screed.*

Better Tamping

An entirely new tamping system has been incorporated for easier operation, greater compaction and density. Single tamper drive is easier to service, removes synchronization problems. Tamper frames are welded from heavy steel angle. Tamper shoes are one inch thick high alloy steel plate with a ¾-inch horizontal compaction surface. Tamper shield design eliminates bridging by giving a rolling action to the material.

Better Spreading

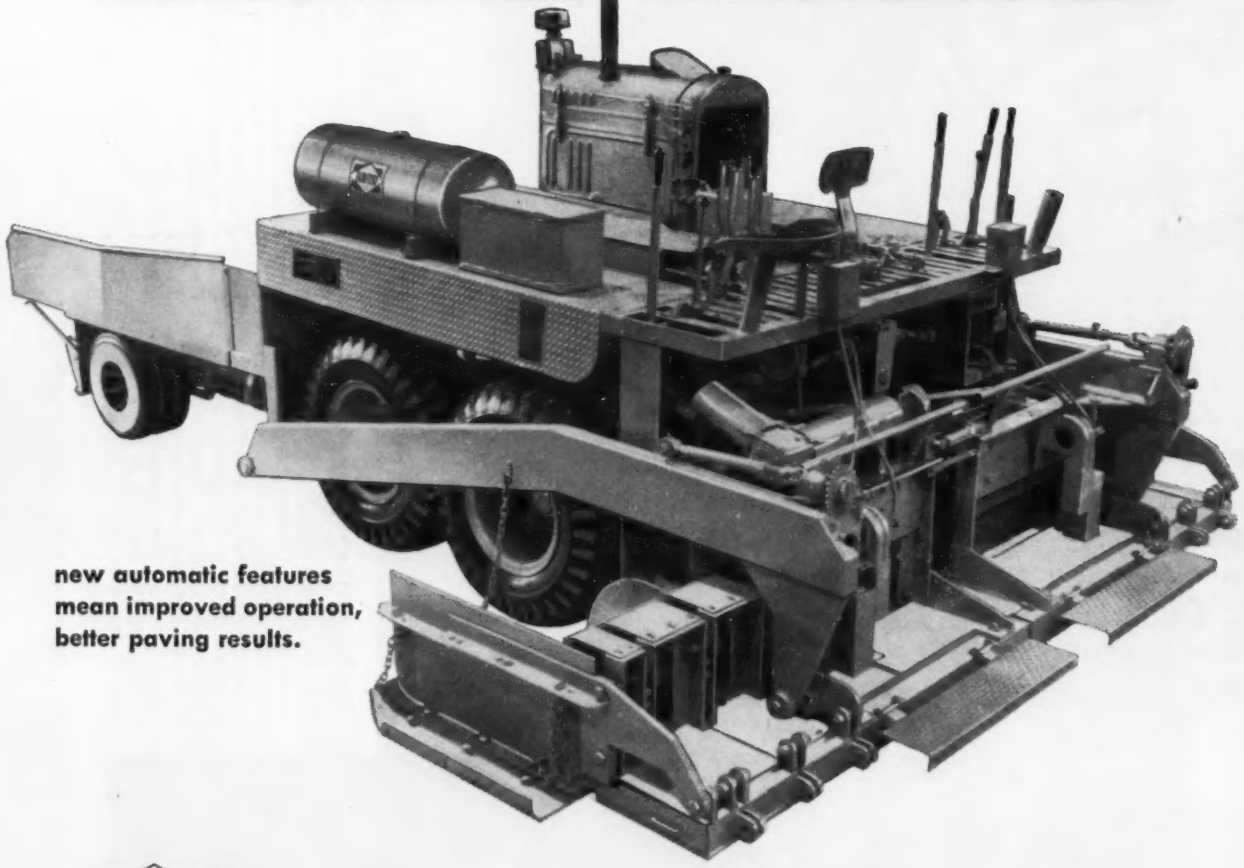
New Augers on the Express Paver are tapered toward center for better distribution of the mix. Auger faces are abrasion-resistant for longer wear. New hangers support the augers and are equipped with sealed anti-friction bearings.

Air Controls

For a small additional investment you can specify the new air control package for more automatic operation of material feed, traction clutch and brakes. Material feed control automatically shuts off conveyor and augers when proper level of mix is reached.

The new traction air clutch provides smoother starting, no clutch adjustment and hydraulic braking is easier with air actuation. Air system is operated from a convenient finger-tip panel which is quickly moved to either side of the machine.

Get full season benefits from this new, improved, machine. Your Blaw-Knox distributor has all the information. Call him today!



new automatic features mean improved operation, better paving results.

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Construction Equipment Division

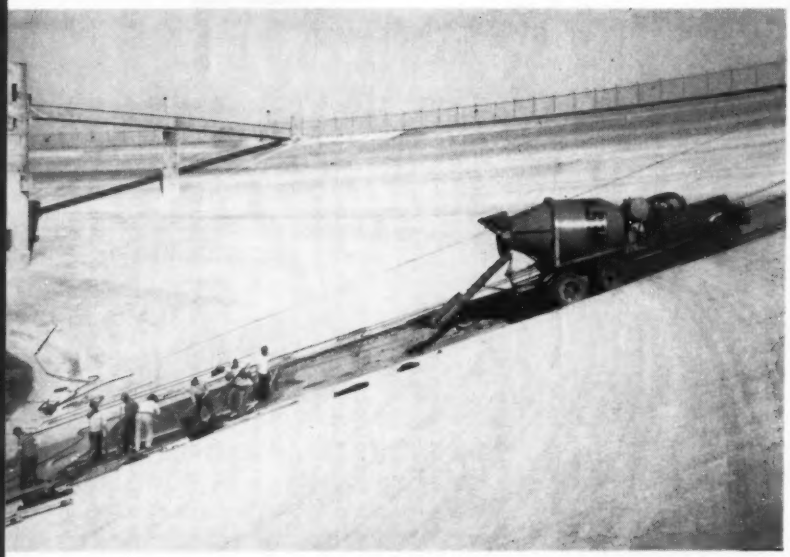
38 Charleston Avenue, Mattoon, Illinois

Erection Team

Five guy derricks erect steel for a 30-story, $50-million building in New York City that will house the Produce Exchange. To provide a 95x65-ft column-free trading area at street level, Harris Structural Steel Co. will place four girders a full story high between the second and third floors to carry the weight of the upper stories.

Underwater Trencher

Koehring crane with a ¾-yd Sauerman Crescent DragScraper digs a pipeline trench across the 700-ft-wide Big Calumet River in Illinois. Crane's hoisting line serves as a track cable for the DragScraper. The cable is dead-ended on the opposite shore. Gary-Hobart Water Corp. dug the trench 6 ft deep in water that averaged 12 ft deep.



Reservoir Paving

Transit-mix truck pours concrete on a 3-to-1 slope for the spillway of Garvey Reservoir at Monterey Park, Calif. Cable to a winch at the top of the reservoir holds the truck in position on the 180-ft slope. The work is part of a $200-million expansion program being carried out by the Metropolitan Water District of Los Angeles.

Our 125-A "QUICK-WAY"® is the busiest machine on the entire job!

R. H. Fritz, Sr., Supt.,
J. E. Milam Construction Company
Macon, Georgia

"QUICK-WAY" 125-A unloading 54" lock joints from flat car to trucks for J. E. Milam Construction Company. Each joint weighs 21,000 lbs.

fast, versatile, economical workhorse

"In over thirty years of experience, operating many sizes of cranes and shovels this "QUICK-WAY" 125-A is the best all around machine for its size that I've ever run. It is easy to operate, fast, well built and the 125-A is capable of much more than it is rated for."—Floyd E. Harrison, operator for the J. E. Milam Construction Company.

And the owner says: "This "QUICK-WAY" 125-A is the busiest machine on the entire job. It is fast and economical, and it has not been down at any time since we have had it. Our 125-A is used extensively for loading and unloading materials, laying 48" and 54" concrete pipe, placing concrete, pile driving, and other work from one end of the job to the other. We work this machine all day and every day.

"Right here we are using the "QUICK-WAY" 125-A as a crane to unload 54" lock joints from flat cars to trucks. Each one of these joints weighs 21,000 lbs. They're part of a large city sewer job for the city of Macon, Georgia. In doing this job we are able to spot flat cars at the most suitable locations along the job and unload with our 125-A. No other equipment on the job could handle this unloading as quickly and as economically as this machine." R. H. Fritz, Sr., Supt., J. E. Milam Construction Company, Macon, Ga.

For demonstrations and prices, see your "QUICK-WAY" distributor.

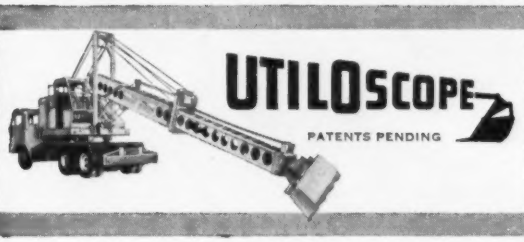
Five "QUICK-WAY" models with more big shovel features

85-A 4/10 yd.—8½ ton
85-AC Crawler
105-A 5/10 yd.—10½ ton
105-AC Crawler
125-A 6/10 yd.—12½ ton

and the "QUICK-WAY" UTILO-SCOPE hydraulic digging attachment

"QUICK-WAY"® TRUCK SHOVEL COMPANY

a Thew Shovel subsidiary — DENVER, COLORADO



"QUICK-WAY" Truck Shovel Co., 2401 E. 40th Ave., Denver 5, Colo.
Please send detailed bulletin on the new "QUICK-WAY" UTILO-SCOPE hydraulic digging attachment.

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Company_____
Address_____
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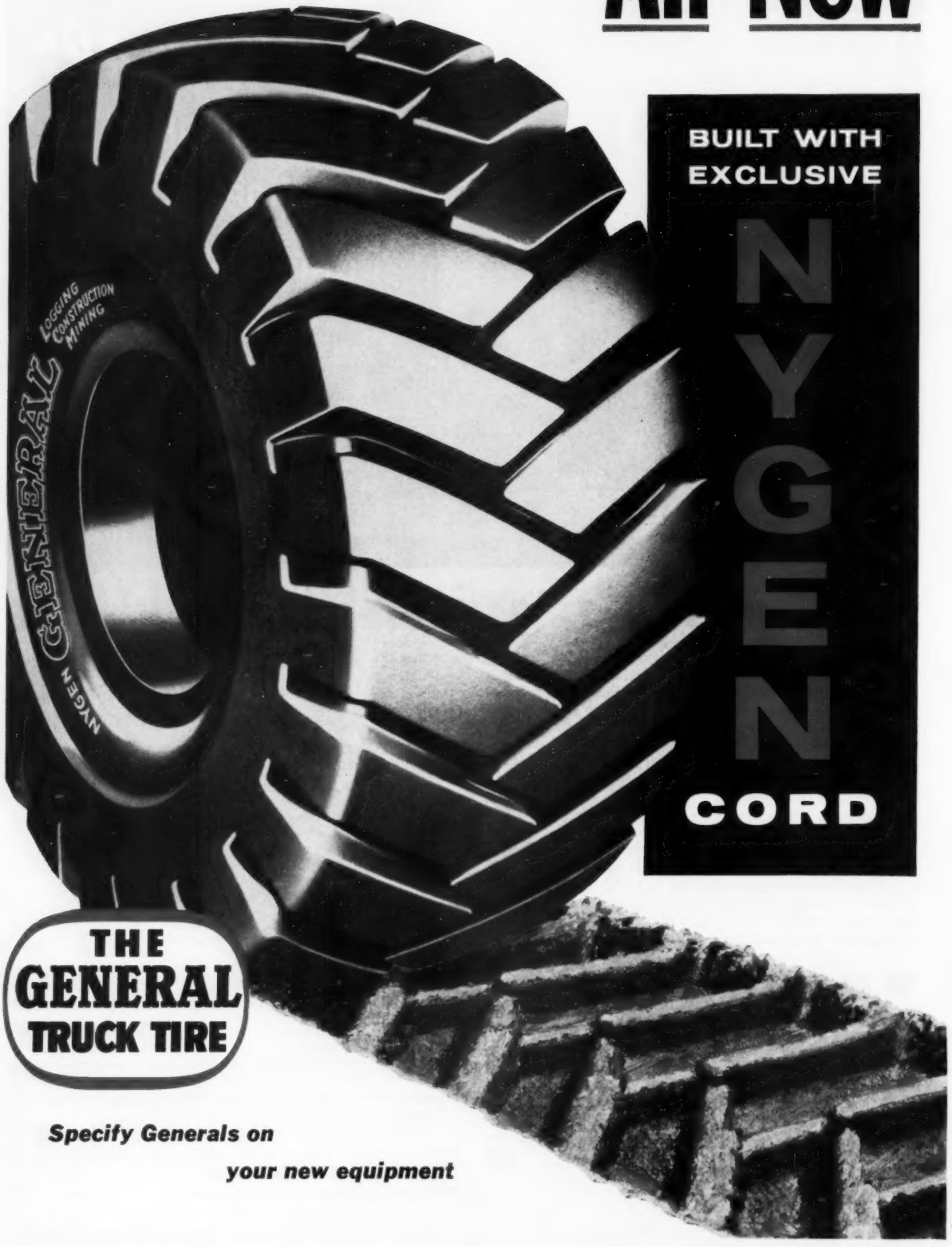
All New



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From Bead to Tread!

THE GREAT NEW, WIDE-BASE

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Offering unsurpassed traction, flotation and job-hazard protection!

Combining a far deeper, wider and huskier tread with exclusive Nygen Cord construction, the all-new General LCM promises, and produces, ever-lower tire operating costs. Engineered to provide traction and flotation beyond all comparison, the General LCM minimizes rolling resistance, powers through the toughest going to get the job done faster. Built to shrug off costly snags, cuts, and bruises, the General LCM is the toughest, brawniest workhorse tire in the field. One demonstration will convince you of its tremendous power and capabilities.

Test it on your toughest job and watch it out-perform anything on wheels!

THE GENERAL TIRE & RUBBER CO.

AKRON, OHIO

Construction 'Round the World . . .

In England

Two Jules Weitz tower cranes, one ready to work, the other being erected, will play key roles in construction of the reinforced concrete U.S. Embassy in Grosvenor Square, London. Wates, Ltd. contractor on the job, claims to be the first British firm to make use of the French cranes that the firm now employs on all its big jobs.

In Belgium

Work crews speed building of the 334-ft-high "Atomium" to ready it for the opening of the Brussels World's Fair on April 17. Landmark of the exposition, the "Atomium," which represents the nuclear structure of an iron crystal atom enlarged 150 billion times, stands near U.S. and Soviet pavilions. It will remain after the Fair closes.

In Canada

An International TD-14 fitted with a job-made sideboom that handles a ¾-yd cable backfiller deposits dirt over a ditched section of pipe on what will be a 79-mi natural gas pipeline between Upsola and Port Arthur in Ontario. The 30-in. line when completed will form part of the Trans-Canada pipeline network now under construction.

$900,000,000
St. Lawrence Power-Seaway Project
proves it again . . .

AGGREGATES FOR LONG SAULT DAM, and the Massena Intake, Iroquois and St. Lawrence Power Dams, are mined and crushed at its Norfolk, N.Y. quarry by Tecon Corporation, Dallas, Texas. Tecon uses Gulf lubricants and fuels for all equipment.

ON-THE-SPOT GULF SERVICE is provided Jack and Jim Maser, excavators from Lancaster, Pa. At left, the late Charles Reynolds, Maser Project Superintendent, compliments Gulf Jobber John Pellegrino on his prompt deliveries. Jack Nicholson, Gulf Sales Engineer, is at right.

...You can depend on Gulf

The St. Lawrence Power-Seaway Project is one of the biggest construction jobs ever tackled by man. It calls for 15,000 workers and $70 million worth of equipment. They'll move 180,000,000 tons of dirt, mud and rock. Create a 70-square-mile lake where cows once grazed. Build a power dam second only to the Grand Coulee in size.

Men and machines often work with a slick but glue-like gumbo underfoot. Temperatures sometimes drop to 50° below. Dragline, crane, shovel, hydraulic jack or drill—dozer, grader, truck, locomotive or tug—no matter what the equipment, Gulf products and service help keep it on the go, three shifts a day, six days a week.

Gulf makes a petroleum product to drive any internal combustion engine—or to keep any powered equipment rolling. You'll find the cost reasonable, the savings in maintenance expense frequently substantial. In addition, a Gulf Sales Engineer is always available, free of charge, to help you with lubrication and fuel problems. All it takes is a phone call to your nearest Gulf office.

LONG SAULT DAM, a $29 million concrete gravity spillway structure, is one of the St. Lawrence Power Projects being rushed to completion with the help of Gulf petroleum products and service. When finished, it will be 2,960 feet long on a curved axis having a radius of 1,600 feet and will require 685,000 cubic yards of concrete.

when the going's tough!

CONTRACT FOR DREDGING SOUTH CORNWALL CHANNEL was awarded to S. J. Groves & Sons Company, of New York City. Groves estimates it will have to remove about 1,800,000 cubic yards. Tug and dragline use Gulf diesel fuel.

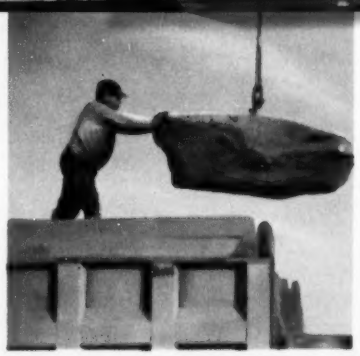
◀ FUEL FOR GROVES' EQUIPMENT is provided from tanks that hold 12,000 gallons of Gulf diesel fuel and 4,000 gallons of Good Gulf Gasoline.

HAULING PILING FROM MASSENA INTAKE, one of the numerous trucking assignments of McConville, Inc., of Ogdensburg, N.Y. McConville is another of the many contractors on the St. Lawrence Power Project who knows he can count on Gulf performance and service.

FREE 88-PAGE "CONTRACTORS' GUIDE"—SEND FOR IT ▶

HUGE BLOCKS are used to line entry to Grass River Lock. Blocks came from stone quarry of Barrett Division of Allied Chemical and Dye Corporation, another Gulf customer.

SPECIAL PIN (eye and wedge) is driven into hole, hoisted by single cable to load truck. Barrett finds this device permits quicker, safer loading.



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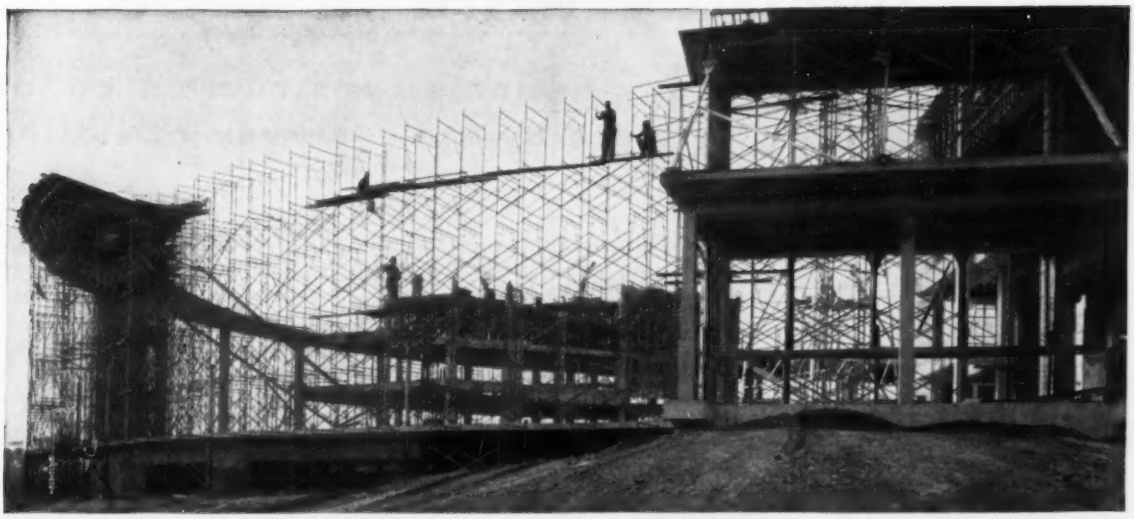
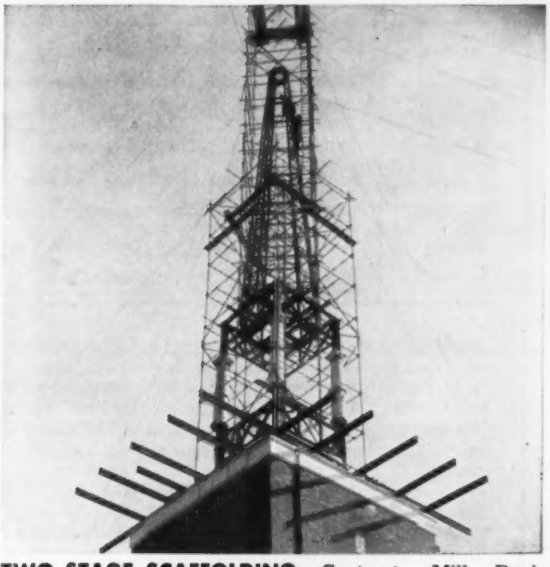
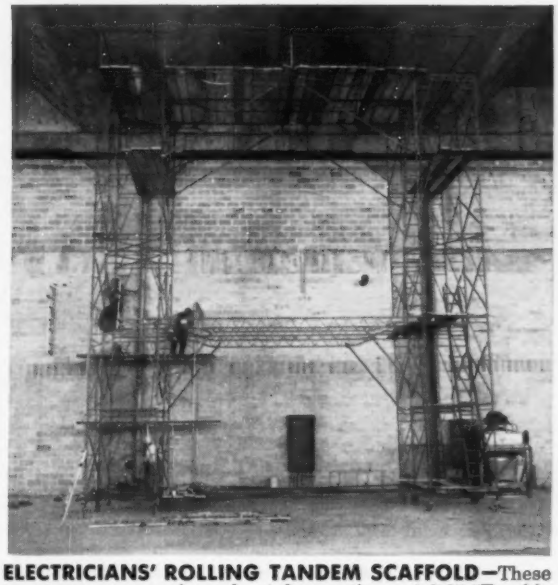


SUPPORTS 270' CONCRETE CANOPY— Handling form work and providing support for circular concrete canopy around the new Municipal Auditorium, Austin, Texas, is simplified for contractor, J. J. Stokes Construction Co., by the use of modern prefab "Trouble Saver"® Steel Shoring. 580 frames are quickly and easily assembled to provide the shoring needed. Planking laid across the tops of frames also provides working plattorms. By using this shoring technique the contractor cuts forming costs all along the line. "Trouble Saver" frames are 5' wide and range in height from 3' to 10', providing broad application variations to meet any scaffolding or shoring job for efficient, lower cost construction.

Scaffolding Methods . . . by Patent Scaffolding Co.



TWO-STAGE SCAFFOLDING— Contractor, Miller Davis Co., uses 3870' of "TubeLox"® Scaffolding for building a steel roof on this 215' spire. After upper portion is done, scaffold is dismantled and re-erected on the I-beams for heavier lower work. New Goodrich Mem. Chapel, Albion, Mich. Made with only four basic parts, this scaffolding is erected rapidly to conform to any shape, size or contour. Variable tube lengths, from 6' to 20', and adjustable couplers assemble to meet job conditions.



ELECTRICIANS' ROLLING TANDEM SCAFFOLD—These two towers are each made of five sections of 6'6" "Trouble Saver" Scaffolding frames set on casters, truss-joined at two points and braced at the bottom with "TubeLox" Scaffolding. They permit the contractor, J. Livingston & Co., to roll along 33'6"-high for electrical work on hangar #12, Idlewild Airport, N. Y. C. "Trouble Saver" Scaffolding accessories permit unlimited scaffolding design and use.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

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(Advertisement)

"More highway work in 1958"

...say nation's construction editors in state-by-state survey of lettings

How much new contract work will there be in your area this year?

For a realistic answer to that question, LeTourneau-Westinghouse has just polled America's construction publications. Purpose of the survey: a down-to-earth appraisal of your specific *business opportunity*... as a roadbuilder... in 1958.

Because some highway progress reports are useless to contractors... in that they include projects years away from actual contract-letting... this L-W study has stressed *contracts.* Editors were asked *not* to consider work still in land-acquisition or preliminary engineering stages... or for which money was merely "apportioned" or "obligated." Instead, they were requested to estimate the actual dollar value of *highway construction contracts to be let this year*... and to compare those figures with 1957 totals.

Here are the editors' reports:

EAST:

Publications in New England and Middle Atlantic states indicate highway lettings this year should *increase by about 30%* over 1957. Here are their comparisons:

	1957	1958	Source
Connecticut	$ 34,547,230	$ 40,000,000	NERBA
Delaware	23,000,000	25,000,000	Constructioneer
Maine	13,919,329	20 to 25,000,000	NERBA
Maryland	60,000,000	65,000,000	Constructioneer
Massachusetts	52,005,937	90 to 105,000,000	NERBA
New Hampshire	18,114,950	25,000,000	NERBA
New Jersey	65,245,000	92,000,000	Constructioneer
New York	246,440,000	280,000,000	Constructioneer
Pennsylvania	185,500,000	272,600,000	Constructioneer
Rhode Island	11,064,415	15 to 18,000,000	NERBA
Vermont	9,937,786	18 to 20,000,000	NERBA

Some background: "Good early pace of lettings indicates bright hopes for 1958 are accurate. Massachusetts, for example, has let $21 million in contracts in first two months... that's 40% of total 1957 volume. And just two early spring jobs in Vermont will total more than the entire volume there last year." (Gordon Gaffney, *New England Road Builders Ass'n.)*... "Contract awards in our area should increase over 27%... and because some states were late in getting started in '57 awards, actual amount of work performed this year may be as much as 60 to 75% greater than last year." (George C. Stewart, *Constructioneer)*... "We agree — contracts let during the calendar year 1958 will be *far* in advance of the contracts let in 1957." (Herb Swartz, *New England Construction)*

SOUTH:

Some weak spots in this area, but over-all outlook is strong, according to editors. Here's the picture:

	1957	1958	Source
Kentucky	$44,097,976	$100,000,000	The Scraper
Louisiana	67,600,000	95,000,000	Construction News
Mississippi	46,786,700	51,910,000	Construction News
N. Carolina	63,754,000	125,000,000	Construction
S. Carolina	42,000,000	56,300,000	Dixie Contractor
Tennessee	55,153,525	111,280,000	Construction News
Virginia	52,035,000	142,000,000	Construction
W. Virginia	20,400,000	71,385,000	Construction

Additional comments: (Figures for Alabama, Florida, and Georgia not available as yet)... "Overall area has outlook for at least a 20% increase over 1957." (Roy L. Kerr, *Dixie Contractor)*... "From what we can find out, Kentucky's goal of $100,000,000 in contract awards by early summer is definitely possible." (Wilson Harper, *The Scraper)*... "In most of our area, contractors can look for 33% more work than they had in 1957." (Ray Metzger, *Construction News)*... "Work is and has been picking up all along in this area. It's safe to say that there will be work for everybody in another six months." (Eddie C. Reid, *Construction)*

Best way to handle new, bigger jobs profitably is with equipment geared to today's higher production needs. In scrapers, L-W Tournapulls® with low, wide Fullpak® scrapers, move more dirt faster than any other dirtmover on the market. There are two Fullpaks: 18-yd "C", and 27-yd "B". Also available is a roadable, utility 9-yd "D", with 138 hp. Check production figures, then ask for a demonstration.

MIDWEST:

Forecasts from 7 publications indicate highway lettings in midwest will jump approximately 50% . . . from $959 million in '57 to $1,439 million in '58.

	1957	1958	Source
Illinois	$105,000,000	$180,000,000	Construction Digest
Indiana	30,000,000	120,000,000	Construction Digest
Iowa	93,500,000	136,000,000	Midwest Contractor
Kansas	65,200,000	75,400,000	Midwest Contractor
Michigan	162,700,000	200,000,000	Mich. Cont. & Bldr. & Mich. Roads & Const.
Minnesota	67,600,000	96,000,000	Construction Bulletin
Missouri	76,608,000	100,200,000	Construction News
Nebraska	33,000,000	48,000,000	Midwest Contractor
N. Dakota	32,800,000	36,000,000	Construction Bulletin
Ohio	200,000,000	300,000,000	Construction Digest
S. Dakota	34,500,000	46,000,000	Construction Bulletin
Wisconsin	58,100,000	101,900,000	Western Builder

Selected comments: "Early year pace of lettings in Wisconsin is *way* ahead of early '57. Makes plan for over $100 million of work look very probable." (Earl P. Keyes, *Western Builder)* . . . "In Minnesota, about $60 million in contracts should be let before June 30. And in South Dakota, the full $46,000,000 may be let in the first 6 months." (G. L. Anderson, *Construction Bulletin)* . . . "Michigan has 5-year master plan for lettings that totals over $1,200,000,000." (Maurice Baker, *Michigan Roads & Construction)* . . . "Indiana's planned 300% increase may seem improbable, but 1957 was far below potential. Governor Handley and Highway Chairman Peters both describe the $120 million program as 'one we know we can complete.'" (Arthur Graham, *Construction Digest)*

SOUTHWEST:

Here's the way construction publications in the southwest size up the '58 highway building year:

	1957	1958	Source
Arizona	$ 38,570,000	$ 41,650,000	Rocky Mt. Const.
Arkansas	20,327,000	48,500,000	Construction News
New Mexico	35,000,000	35,000,000	Rocky Mt. Const.
Oklahoma	37,962,000	41,759,000	Midwest Contractor
Texas	223,600,000	250,000,000	Texas Contractor

What they're saying: "That $250 million Texas figure is not for right-of-way purchases, preliminary engineering, maintenance, or force account work. It is the amount that will be put under contract this year through road contractors." (Wm. B. Morrison, *Texas Contractor)* . . . "Looks like a good year. Comparison of state highway lettings of 1957 to planned lettings for '58 shows an increase of about 13%. This has been confirmed by awarding authorities." (James I. Clayton, *Rocky Mountain Construction)* . . . "Arizona's made a big jump in its highway spending. Its current fiscal year budget is 46.7% larger than last year's." (John D. Bowler, *Southwest Builder & Contractor)*

WEST:

One of the strongest areas of all in 1958 outlook, despite "leveling off" in some states. Here's the rundown:

	1957	1958	Source
California	Not available	$220,000,000	SW Bldr. & Cont.
Colorado	$55,900,000	57,500,000	Rocky Mt. Const.
Idaho	19,000,000	25,000,000	Pac. Bldr. & Engr.
Montana	27,000,000	46,925,000	Pac. Bldr. & Engr.
Nevada	13,700,000	32,366,000	Rocky Mt. Const.
Oregon	41,000,000	50,000,000	Pac. Bldr. & Engr.
Utah	20,370,000	41,120,000	Rocky Mt. Const.
Washington	51,000,000	55 to 65,000,000	Pac. Bldr. & Engr.
Wyoming	35,442,000	36,100,000	Rocky Mt. Const.

Observations: "Highway construction along the coast should be up about 25%." (Roscoe Laing, *Pacific Builder & Engineer)* . . . "Note the tremendous gains planned in expenditures for Nevada and Utah. They're due to the fact that both states are now in position to place a large amount of interstate work under contract." (Jack Tarpley, *Rocky Mountain Construction)*

LeTourneau-Westinghouse thanks editors and publishers who helped prepare this survey . . . and hopes it encourages you as you plan for the construction season ahead.

LeTOURNEAU-WESTINGHOUSE COMPANY

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

1900-DC-2

5 men can install a drainage structure like this in 2 days! A big 72″ diameter USS AmBridge Sectional Plate Pipe 60′ long can be erected on the job and backfilled ready for use in *two days, with a five-man* crew using simple hoisting equipment and standard hand tools. *You just can't build 'em as fast with other materials.*

Another important advantage is that the structure can be used immediately after backfilling. Traffic interruptions are held to a minimum. In some instances, structures can be erected on the bank of a stream and lifted or rolled in.

No forms needed . . . no breakage! *USS AmBridge Sectional Plate Pipe, Pipe-Arches and Arches* eliminate the need for forms . . . and, being made of steel, there is no breakage. They are permanent . . . they can be extended whenever a fill or road is widened. Fabricated to meet all federal and state specifications, they are available in a complete range of standard sizes to satisfy the design requirements for any waterway opening.

FOR A FREE COPY of our 28-page AmBridge Sectional Plate catalog, write direct to our Pittsburgh office. For information on smaller drainage structures made from USS Galvanized Corrugated Culvert Sheets, please send your inquiry to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh, Pa.

KEEP OUR ROADS ON THE GO

American build more road

General Offices: 525 William Penn Place, Pittsburgh, Pa. Contracting Offices in: Ambridge · Atlanta · Baltimore · Birmingham Boston · Chicago · Cincinnati · Cleveland · Dallas · Denver · Detroit · Elmira · Gary · Houston · Los Angeles · Memphis · Minneapolis New York · Orange, Texas · Philadelphia · Pittsburgh · Portland, Ore. · Roanoke · St. Louis · San Francisco · Trenton United States Steel Export Company, New York

Steel bridge erected in 7 working days! The 320′ long Evans Center-Eden Road Bridge on the New York Thruway contains 175 tons of *structural steel* fabricated and erected by American Bridge. Three of its five beam spans are 74′ 9⅛″ long. This is another example of the time- and money-saving advantages of building with steel. Steel also saves freight costs and storage space. Steel can be erected in *any* season. Steel can be accurately inspected at any time.

USS AmBridge I-Beam-Lok saves money on erection and maintenance. This lightweight, long-life flooring for modern traffic is available in units 6′ 2″ wide and up to 49′ long. With its full 5″ depth, it can be applied directly to stringers on spans up to 4′ centers to permit H-20 loadings. It does not require secondary supports. Ease and speed of installation minimize traffic interruptions. Shown here in open-type, it is also available in units ready to be filled with concrete. For detailed information, ask for free copy of 32-page catalog. Covers advantages, specifications and installation.

USS, AmBridge and I-Beam-Lok are registered trademarks

Bridge helps you for the money!

American Bridge
Division of USS **United States Steel**

B.F.Goodrich report:

Rocks headed for tomorrow's turnpike

B.F.Goodrich improvements in rubber brought extra savings

Problem: Those big rocks are on their way to be crushed into little ones. With millions of tons needed for highway construction, rocks must be handled at low cost. The owners of this crushing plant knew a conveyor belt would be the ideal way—cheaper, faster than old skip-car method. But the belt would take a terrific beating. That load is not only heavy, it has sharp, jagged edges, too.

What's done: The B.F.Goodrich distributor recommended a cord conveyor belt for this job. In this B.F.Goodrich belt, hundreds of cords, running the entire length, buried in the rubber, add so much strength that a single belt can travel distances and carry loads once considered impossible. It stands crashing blows that would gouge or break many ordinary belts.

Savings: After 9 years, and 14 million tons, the B.F.Goodrich belt pictured here is still going strong. Handling costs have gone way down.

Extra benefits: But good as this record is, chances are that it will soon be bettered because of the improvements B. F. Goodrich is constantly making in conveyor belting. In recent years, for example, the use of Nyfil fabrics has resulted in cord belts that last even longer, carry heavier loads, stand even more pounding.

Where to buy: Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich cord belt described here. And, as a factory-trained specialist in rubber products, he can answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-327, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

Construction Methods AND EQUIPMENT

APRIL, 1958

VOLUME 40 • NUMBER 4

HENRY T. PEREZ, Editor

Recession Roadbuilding

THE YEAR 1958 will be a good one for roadbuilders—at least in volume of work. Results of our survey of state highway department plans (page 42) indicate that outlays will be 30 to 40% above last year's. And current Congressional action on highway spending bills indicates that these ambitious increases can be carried out. But this may cause trouble in years ahead.

The bill, passed by Congress, provides $400 million for immediate use on the ABC System (primary, secondary, and urban highways). In addition, it makes it easier for the states to pay their share of the cost. The bill not only ups the Federal financial participation from 50% of the cost to 66 2/3%, but also provides for lending the states an additional 22% of the costs. This loan would be repaid from future allotments. Thus part of the ABC System temporarily would approach the 90-10 basis of the Interstate System.

The Interstate System gets a boost, too, under the new bill. It would be allocated an additional $220 million in Federal-State funds in fiscal 1959 and an extra $1 billion in 1960. This latter, plus $1.75 billion already available under present law, would be apportioned to the states this July—six months ahead of schedule. Other provisions would authorize $900 million for ABC roads in both fiscal 1960 and 1961, and would increase expenditures for Public Domain roads.

In all, this should add $1.8 billion of Federal money to the highway program. With matching funds from the states, along with previous authorizations, the money to be spent for Federal-aid highways in the next three fiscal years totals $14.4 billion.

And that is fine for the contractor. Yet, while it may seem ungrateful to question an act that benefits construction, there is one unfortunate aspect to Washington's move. That is that Congress is not primarily interested in building a first-class highway system. It is trying to halt a business recession. And the danger is that accelerated roadbuilding now will result in drastic cut-backs later.

Unless we are careful, we may find ourselves saddled with more "Byrd amendments," more attempts at Trust Fund raids, more stretch-outs of what was originally proposed as a 10-year roadbuilding plan. We must make sure that the current gains are not lost when business returns to "normal."

Huge Truck

DUMPING—When the three-stage, 13½-ft hydraulic hoist lifts into dumping position, the huge box reaches up into the air 45 ft, almost as high as a four-story building.

YOU'RE DRIVING down the haul road at Oahe Dam, not especially concerned, but alert as you have to be when a lot of heavy equipment is bustling back and forth at a pace that jounces the jockeys on their seats. And then it comes around a curve. Your instinctive impulse, and you have to fight it down, is to twist the wheel and head for the hills.

What you have just spotted is the world's biggest dump truck. Western Contracting Corporation of Sioux City, Iowa, recently put it on the road. It is an 18-wheel, 750-hp, semi-trailer behemoth that in current tests totes a net payload of 165 tons without staggering.

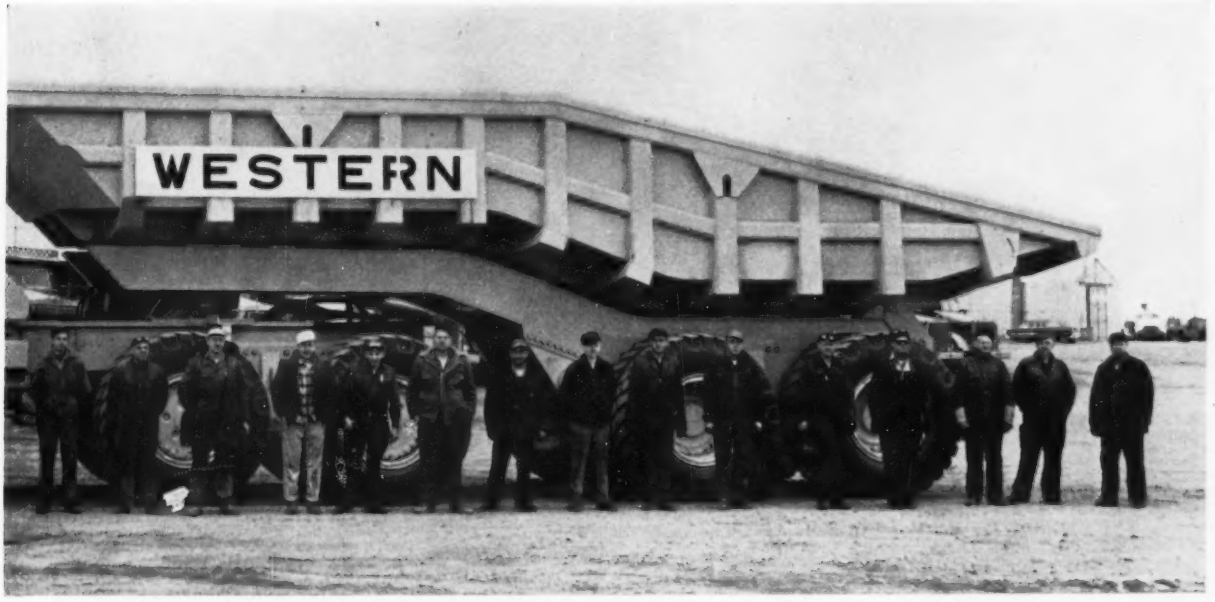
Its overall height is 14 ft; its overall width, 15½ ft. When its 13½-ft hydraulic hoist lifts into end-dump position, the box reaches upward 45 ft—higher than a four-story building. Its empty weight is 78½ tons; its designed total weight loaded, 199½ tons; its capacity — at struck measure—80 cu yd. Its top speed is 35 mph.

But mere statistics don't get the idea across. On big jobs—and Oahe is the world's largest rolled earth dam—big machines usually don't seem outsize. Not so with this truck. It towers above other vehicles as a mastadon might stand out in a herd of elephants. The result has to be seen to be believed.

The truck is interesting not only of itself but also as it reflects Western's philosophy in the use of equipment. The approach of many contractors is to use the minimum of equipment necessary to carry out a job. They argue that this cuts down their investment. Western, which does a volume of about $35 million a year, principally in earthmoving and road work, holds the opposite viewpoint. They saturate a job with equipment, and capitalize on the efficiency of mechanization. Western's idea is to wrap up the job fast and turn the equipment over for other work.

Western's $8.8-million, Stage 6 earthwork job at Oahe, a Missouri River project of the Corps

The biggest dump truck in the world, a monster capable of carrying a payload of 110 yd is proving itself in tests at Oahe Dam. It's the creation of Western Contracting Corp.



POSING—Twenty men of Western Contracting Corp.'s crew at Oahe Dam line up in front of the mighty hauler—and they've plenty of elbow room. The box alone is 46 ft long.

Moves Dirt in 165-Ton Loads

of Engineers near Pierre, S. D., offers field examples in the company's thinking. For the 24,500,000-yd job, Western has 167 pieces of Euclid equipment alone.

The manner of its employment was effectively attested in the spillway portion where, in adjacent areas, Western and another contractor both were removing shale with twin-engined scrapers. The scrapers of the adjacent contractor were going it alone. They grunted and slowed as they bit into the soft rock, but they did the job. Western's identical units were aided by two twin-engined pusher tractors. The scrapers gathered up their load and were on their way in a jiffy.

Western used more engines to

HAULING—On the downgrade haul road at Oahe, the truck's two 375-hp Cummins diesels move it along at a top speed of 35 mph. It would need more power for uphill work.

IN THE BOX—Army engineers explore the bed of the big earthmover. Its overall width is 15½ ft, and it is built of T-1 steel, a new high-strength, lightweight alloy.

TRUCK HAULS 165-TON LOADS

continued

do the task that another contractor was carrying out with two. When it was pointed out that this seemed sweeping open-handedness in the use of machinery, Western pointed to production rates and cost curves to show that it made good business sense.

Western constantly is on the alert for more and more efficient equipment and an ever higher standard of mechanical performance to keep ahead of the field. They take several routes to reach this goal. They work with manufacturers to develop new machines. Western tested the prototype of Euclid's 35-yd end dump truck and purchased 23 of the first 26 produced by the firm.

They get manufacturers to modify or build equipment to its needs. Western's 14-yd electric shovels, for example, were made with unusually short booms. The result is a tool that is a whiz at cycling in loading trucks.

Western tinkers with standard equipment to meet specific needs; indeed, it's hard to find a standard piece of machinery in Western's yard that hasn't been modified in some way. Their scrapers, for example, are hot-rod machines with souped-up power and increased capacity. If manufacturers aren't interested in developing a new piece of equipment, the firm does it on its own.

Hence the truck. The Oahe job is sprawled out, with as much as 2 mi from borrow pit to fill area. This layout pointed to a hauling unit that was really big. Unable to interest a manufacturer in the idea, Western went ahead on its own.

The basis of the rig is a 35-yd Euclid end dump truck. Western stripped off the dump body and went on from there. The frame was beefed up by welding on reinforcing. The two Cummins 300-hp diesels were stepped up to 375 hp each by the addition of turbosuperchargers and by increasing their rpm's. The hydraulic system was replaced, and the air system radically altered.

All of this work was in preparation to receive the semi-trailer portion, the box and frame of which were fabricated by the Eaton Metal Products Company of Omaha, Neb. They built it of T-1 steel in the most extensive use to date of this new alloy. T-1 steel requires special welding techniques so U. S. Steel Corp. specialists worked with Eaton to carry out the assignment. By using T-1, which has a tensile strength of 110,000 psi as contrasted with standard steel's 55,000 to 60,000 psi, Western estimates it saved 12½ tons in dead weight, or 25% of the trailer's weight.

Because T-1 steel is obtainable only in plates, all members had to be built up by welding. Sizes ranged up to the 24x12-in. box section of 1⅛-in. plate in the main frame. Reinforcing for the box was formed in channels through which exhaust gases are piped to keep the load from freezing and sticking in cold weather. The whole assembly is mounted on a standard Euclid eight-wheel bogy with 32-ply tires 18-33.00.

The hydraulic system took some doing. To hoist the box the required height in the target time of 15 to 18 sec required a hydraulic system with a capacity of 640 gal of oil a min, far larger

EARTHMOVING EXPERTS—Hubert Everist, Jr., (left) equipment manager for Western, conceived idea of building truck. With him is Carl Collins, Western's project manager.

than the largest hydraulic system available. Western's solution was to rig up four systems in a bank to give the required capacity.

The hydraulic hoist also was a problem. The need was for a three-stage hoist, ranging in diameter from 21½ in. to 10 in., with a maximum extended length of 13½ ft and 2,500 lb pressure. None was commercially available, and no manufacturer showed any interest in making one. So Western turned out the hoist in their own shop.

All the hardware for the hydraulic system and the five reinforcing torque tubes, each rolled from ¾-in. plate into 14-in.-dia cylinders, so cluttered up the underside of the big tractor that there wasn't room for the air system tank. An ingenious idea solved that one. The torque tubes were tapped to become the reservoirs for the air system that operates the brakes and steering.

The machine began shakedown runs and field tests on March 6. Surprisingly, few "bugs" showed up. Testing began with a design load of 80 yd—Oahe's shale runs about 3,000 lb per cu yd—and was increased gradually until the load heaped out at 110 yd. The truck has taken all tests without a quiver.

Final judgment remains to be passed on the machine, says Hubert H. Everist, Jr., treasurer and equipment manager for Western. Not until after about 45 days of operation will Western have production figures that will enable them to calculate cost factors, he said.

However, he said, preliminary experience tentatively points to the machine as a specialized piece of equipment for a multi-million-yard job with a long haul and firm road conditions.

These, he said, are some preliminary conclusions, subject to confirmation by further testing:

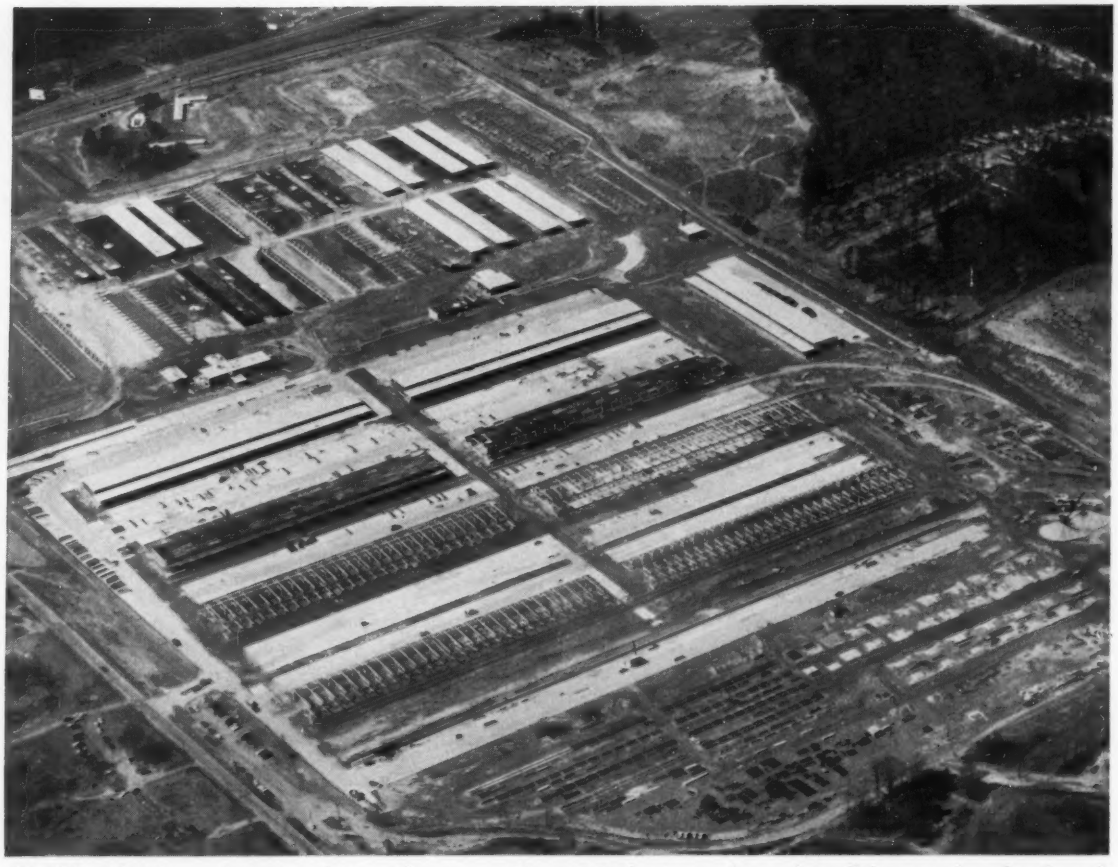
- The machine is underpowered, but this is no particular handicap at Oahe where the haul road is downgrade. When 500-hp engines are available, they will be installed to bring the weight-power ratio into balance. Uphill work should then be no problem.
- With 18 wheels under the load, weight is well distributed, and tire pressures are no higher than on the 35-yd Eucs.
- The ultimate answer to the truck's practicality may lie in the feasibility of loading equipment scaled to the truck. The 14-yd buckets now in use are not big enough. The feasibility of operating bigger draglines is a question to be investigated.
- The net investment in a fleet of big trucks would be about the same as the investment in a fleet of standard trucks with equal total capacity. Fewer pieces of equipment would be an advantage in keeping the work synchronized.
- The big trucks have a turning radius of 45-50 feet and get around handily. Their larger size makes for fewer units to cause congestion where working space is limited.

Western began field work on its Stage 6 contract January 1 in an area where the construction season normally starts April 1. Currently progress stands at 14% completion against a scheduled 5%. Army Engineers say progress of the work insures going ahead this August with diversion, which is part of the contract. Production currently is 90,000 yd per day. Bigger production is expected after diversion. As a preliminary to diversion, Western has made its first encroachment on the river, narrowing the 600-ft gap down to 350 ft.

Western has held major earthmoving contracts on all of the Missouri River dams. At Oahe its total excavation, with the completion of Stage 6, will total 77,080,000 cu yd. In 1956 the firm established a record for one contract at Oahe by loading and hauling 143,000 cu yd of material in one day. In addition they hold a safety record of 1,877,000 continuous man-hours without a lost time accident at Oahe Dam.

Hubert H. Everist, Jr., was directly responsible for the development of the truck. Its design was by the Charles W. Jones Engineering Company of Los Angeles, Calif. Project manager at Oahe is Carl "Rip" Collins. Other company officers are Hubert H. Everist, Sr., chairman of the board of directors; Marshall B. Jones, president, and L. Garland Everist, secretary and construction manager.

Oahe is under the general direction of the Missouri River Division of Army Engineers, Col. D. G. Hammond, district engineer. John W. Sibert, Jr., is Oahe area egnineer. Lew Leavitt is resident engineer on earthwork.



BIG JOB—Atlanta's new farmers' market spreads out over 140 acres. Two casting yards (foreground) are turning out more than 2,000 framing members and a still larger number of roof panels for approximately 50 buildings and other structures on the site.

Precast Concrete Frames

CAST heavy concrete framing members one day; erect them the next day. That's the top-speed production of the contractor for a farmers' market that will spread over 140 acres near Atlanta, Ga.

Thompson & Street of Atlanta and Charlotte, N. C., will cast and erect more than 2,000 framing members weighing from 5 to 14 tons and many more roof panels for the $7.5-million job. They are building 32 farmers' sheds, 9 dealers' buildings, and several administrative and service buildings.

An artificial curing process makes possible the fast casting-erection cycle. Vacuum pumps hooked up to special job-built forms pull 15% to 20% of water by volume from the precast members in a matter of hours. The frames are strong enough to erect only 24 hr after casting.

The system also is a cost-cutter. T&S figure they would need three times as many forms if they depended on natural curing. And they say the vacuum curing process makes it possible to reduce the percentage of cement in the concrete without sacrificing strength. In addition, it minimizes the effect of Georgia's capricious winter weather. Forms are left in place only about 30 min longer during "cold" days when the temperature is in the mid-30's.

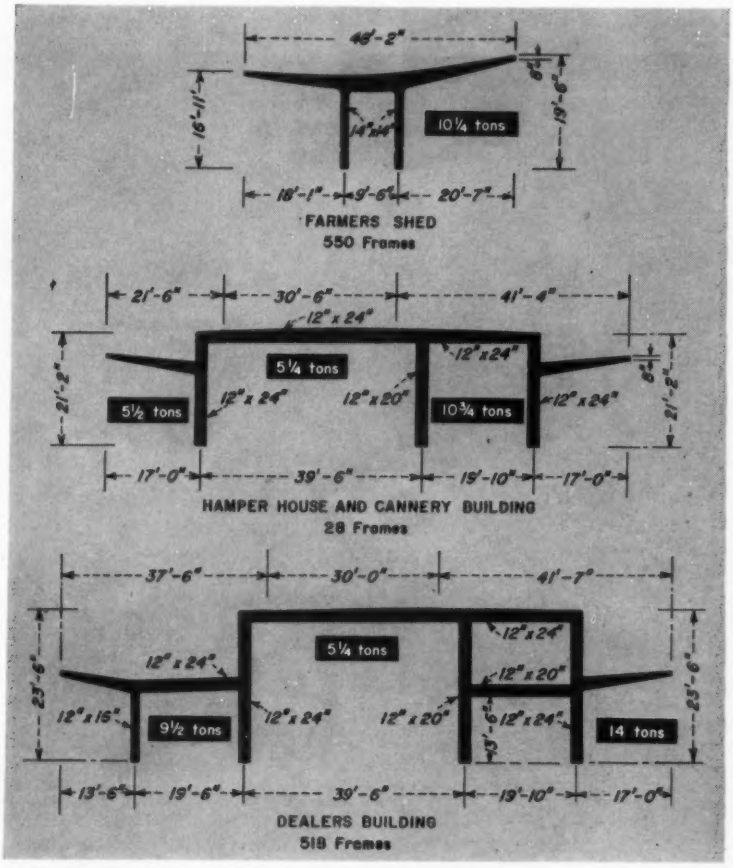
Casting

T&S operates two casting yards —one for the heavy framing members and one for roof panels. In the casting yard for the framing members, the contractor has 14 forms to produce the 550 frames for the farmers' sheds and 8 sets of forms for the 518 three-part dealers' building frames.

In general, the work schedule is to pour half the available forms every day and strip and erect the units from the other half, poured the day before. In this way, they keep both the casting and the erection phases of the work progressing at a steady pace.

Concrete comes from a plant with a capacity of 850 cu yd per day spotted about 850 yd from the nearer casting yard. Transit-mix trucks deliver the mix and dump it directly into the forms.

Concrete mix contains 564 lb of Lehigh, type III cement per yd. Other ingredients (per cu yd) are: 1,275 lb of fine aggregate with moisture at 4%; 1,900 lb of



FRAMES—Contractor has 14 forms for the farmers' sheds frames and 8 sets of forms for the three-part dealers' building frames. They pour half the forms every day.

Cure Overnight

coarse aggregate with no moisture content; and 33 gal of water. Slump is 3 in. No admixture is used.

The concrete is vibrated with Thor and Master electric vibrators and coated with Hunt curing compound. No hand finishing is necessary.

Forms

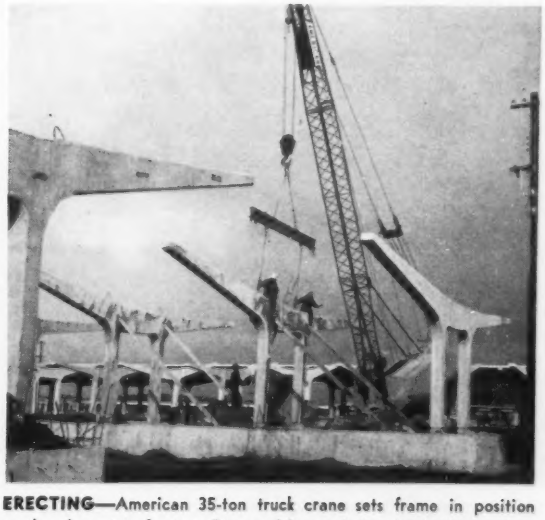
The side forms for the framing members are the key to the vacuum process of moisture removal. Ordinarily they are shop fabricated, but they can be modified or even built in the casting yards.

From the inside out, the forms consist of a layer of heavy cloth, a layer of standard-mesh screen wire, a layer of standard-mesh metal lath, and, on the outside, a facing of ¾-in. plywood. The layers are stapled together. One-in. strips of ⅛-in. plywood or Masonite form air-tight seals around all four edges. Angle irons set in the casting beds hold the forms in place.

In these forms, ¾-in. nipples penetrate the plywood facing at 30-in. intervals. Short lengths of 1-in. rubber hose connect the nipples to a 2-in. reinforced rubber manifold that runs parallel with the form. The terminal end of the manifold is sealed, and the other end is connected to one of the six intakes on a Fuller vacuum pump. Crutch tips seal off nipples not in use. Air passing through the open top surface of the concrete pulls water down, through the nipples, into the manifold, and up to the pump for discharge.

Under ideal conditions, a single

CASTING—Transit-mix truck dumps concrete directly into form where it is screeded and vibrated. No hand finishing is necessary.



ERECTING—American 35-ton truck crane sets frame in position on dowels cast in footing. Diagonal braces help plumb the member.

Cranes Erect Average of 12 Frames Daily

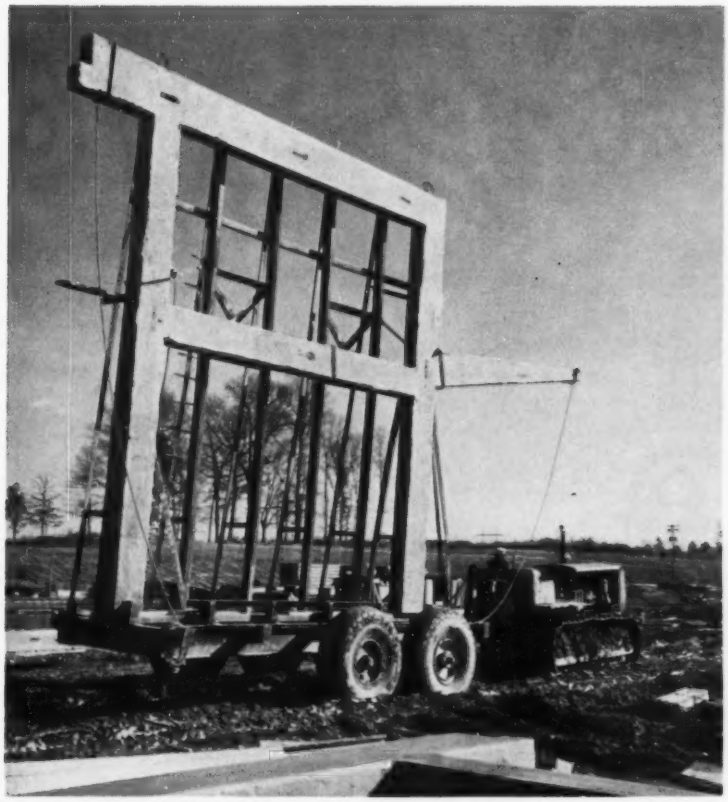
manifold can cure an entire 25x36-ft framing member. In the somewhat less-than-ideal conditions that usually prevail, T&S puts a manifold on either side of the form. In this case, one pump can cure three framing members at a time.

In the panel casting yard, the process is substantially the same except that moisture is pulled from the thin roof panels by top-mounting mats of similar plywood-lathe-screening-cloth construction.

Breakage on stripping is about 1%. American and Lorain 35-ton truck cranes lift the heavy frames from their forms by hooking on

STRIPPING A FRAME—Crane lifts heavy member from its form through ½ and ¾-in. steel cables cast into top of the frame. Air blast of 125 psi helps break the bond.

CURING PANELS—Secret of the fast casting-erection cycle is a vacuum process for pulling up to 20% of water by volume from the precast members in a matter of hours. Hose connects top-mounting mats to manifold. Pump on truck can handle six manifolds at a time.



HAULING A FRAME—Contractor-built wagon pulled by D8 tractor moves heavy unit from casting yard to erection site in upright position tied to a vertical steel frame.

to ½ and ¾-in. steel cables cast into the top of each frame. An air blast of 125 psi applied on 8-ft centers helps break the bond between form and frame.

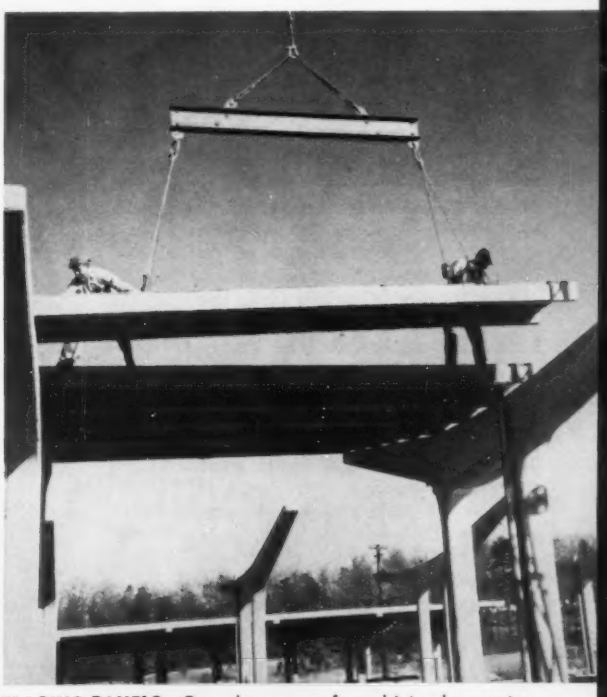
After stripping, the cloth on the inside surfaces of the form is hosed down and brushed off before the concrete that clings to it can set. Fast, thorough maintenance makes it possible to re-use each form 10 to 15 times before the cloth, and sometimes the screen beneath it, must be replaced.

An air blast also helps strip the roof panels from their forms. Then, they are hauled to the erection site by Ross and Hyster straddle carriers that can handle five of them at a time.

To move the heavy frames from the casting yard to the erection site, the contractor designed a wagon that hauls them in an upright position tied to a vertical steel frame on the bed of the wagon. A Caterpillar D8 pulls the wagon.

Cranes set the frames in position on dowels cast in the footings. Adjustable diagonal braces to the adjoining footing plumb each member, then it is grouted through a grouting sleeve.

HAULING PANELS—Straddle carrier hauls a load of five roof panels from the casting yard to point where they will be erected.



PLACING PANELS—Crane lowers a roof panel into place on top of framing members for one of the 32 farmers' sheds in the project.

BIG SPAN—Four jacking towers on two barges lift 295-ft main bridge span. Barges move between piers at high tide. Span settles onto piers as tide falls. Unusual erection method is required because cantilever center span has to go in before suspended spans.

Girders Ride Tide into Place

TIME AND TIDE, harnessed by a crew of imaginative bridge builders, were the main ingredients in a clever bridge erection at Cos Cob, Conn.

The J. K. Welding Corp. of Yonkers, N. Y., had a $2.8-million contract for steel fabrication and erection on the Connecticut Turnpike bridge over the Mianus River. Erecting the 100-ft land spans in the 2,700-ft plate girder bridge and viaduct was a routine operation. Placing the 136-ton girders over the main span of the river was a tougher problem.

Four of these girders form the two parallel spans of the dual-lane highway bridge. The bridge crosses the 100-ft channel at an angle of 37 deg, making the distance between piers 205 ft. The girders are 295 ft long so they can cantilever an extra 45 ft over each pier. Each girder is 14 ft deep at the piers and 9 ft deep at mid-span.

Several factors ruled out normal erection methods. The main span had to go in first because it carries a suspended span at each end. This meant that it was impossible for traveler cranes, working out from the abutments,

continued on page 92

FLOATING JACKS—Two barges, held together by bridge floorbeams welded across decks, carry four jacking towers. On towers, 100-ton jacks raise the 335-ton spans.

(Advertisement)

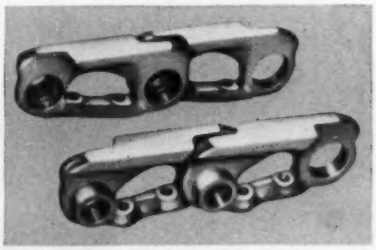
PRETESTING STEEL IS ONE WAY MATCHLESS QUALITY IS ASSURED IN GENUINE CATERPILLAR PARTS

Careful selection of material gives greater strength to new D8 strutless track links

Quality doesn't just happen. The world-famous quality that is the hallmark of Caterpillar earthmoving equipment is a direct result of never-ending research, the finest possible materials, and persistent attention to every manufacturing detail. This is true of Caterpillar machines. And it is true of Caterpillar parts.

The new, strutless link for Cat D8 Diesel Tractors is an example of this emphasis on quality. Each link is able to bear the entire weight of the tractor, over and over again, in the roughest of terrains and climates. This is how Caterpillar makes sure these links meet this challenge:

All steel used for links is given an extensive series of tests *before* manufacture. In the Caterpillar Metallurgical Laboratory it is first analyzed for chemical composition by a spectrograph—slight variances in chemical make-up can result in big differences in the finished product. Then the steel is tested for hardenability; in other words, the degree to which it will respond to heat treating. Resistance to impact loads is measured to insure the track link will give maximum performance under all conditions. Steel that cannot be made into Caterpillar quality links is rejected.



New, strutless link for Caterpillar D8 Diesel Tractors.

The new D8 link is forged—the best way to make a link. Forgings are more dense. They have "inner flow lines"—the equivalent of grain in wood—following the contour of the part, providing greater strength at critical locations as well as resistance to breakage.

"Dubbed-off" link ends eliminate damage to rollers and mating links. Strategic designing of steel into the bushing boss and arch improves fatigue strength. Links are *double* heat treated, furnace heated for a tough core, and "Hi-Electro" hardened for a deep, superhard rail surface.

Features like these mean one thing. A Caterpillar part is your best buy. Your Caterpillar Dealer has full information on the new D8 strutless links and the other quality Cat parts. See him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

SERVICE TIP

For maximum life, tracks should have 1½" to 2" of slack. Your Operation and Maintenance Instructions have complete adjustment details.

CATERPILLAR

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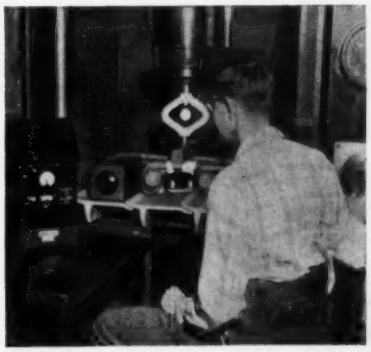
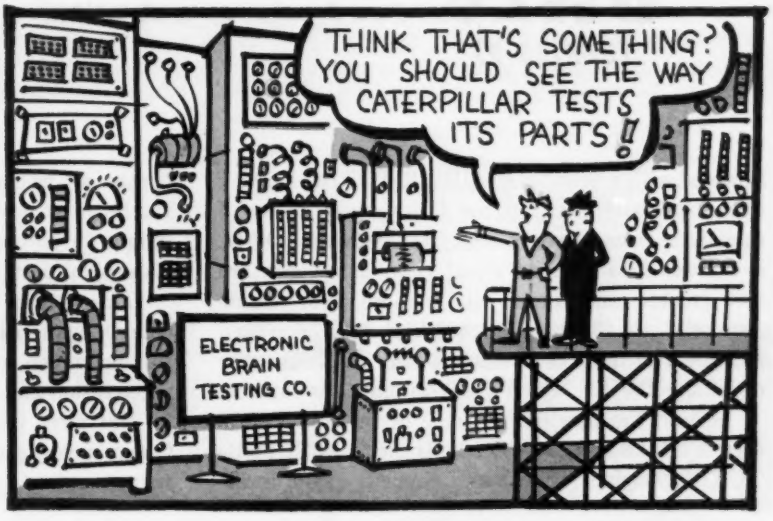
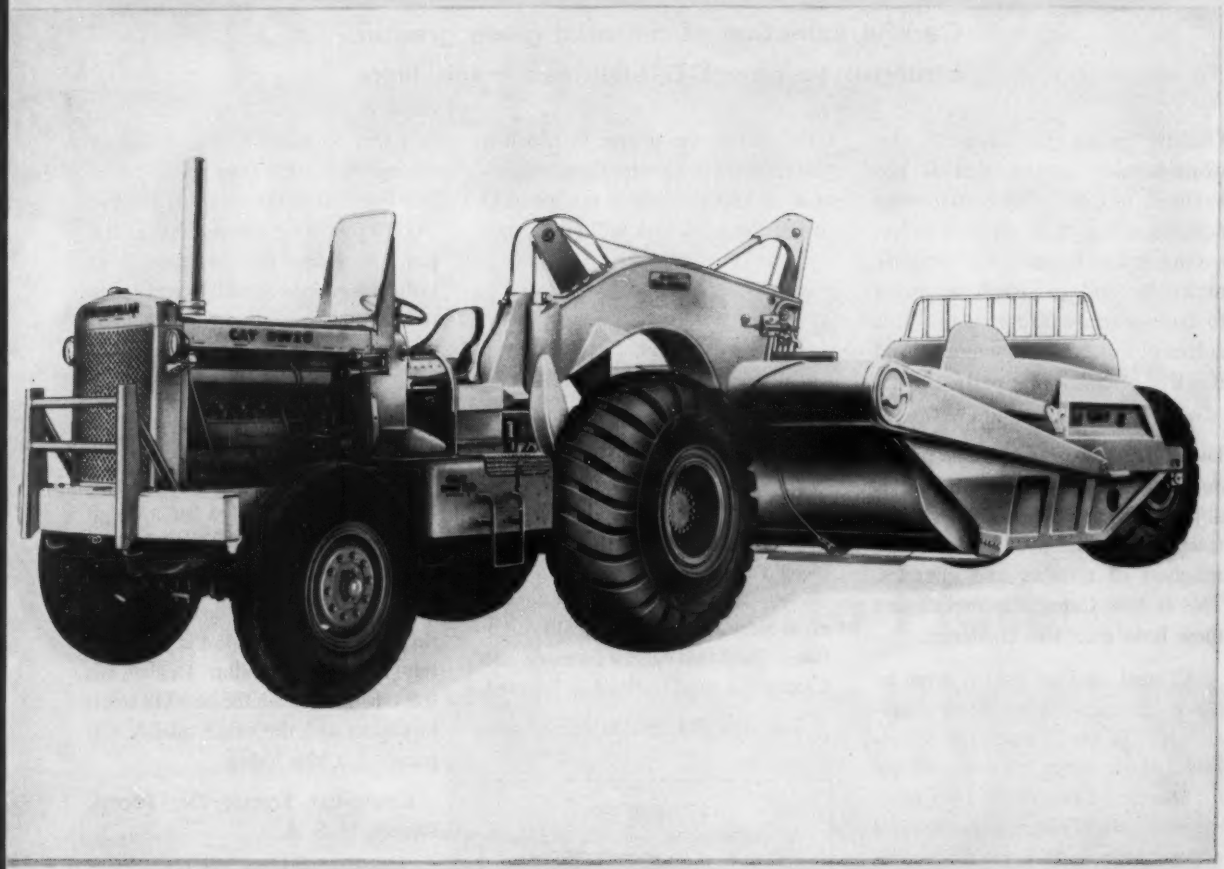


LINK STRENGTH is measured on this hydraulic press. The design of Caterpillar track parts is under constant examination by the most extensive research facilities in the industry.



HERE THEY ARE!

DW20 and DW21 WITH



DW20
(SERIES F)

New HP—320 (maximum output)!
New Torque—28% torque rise!
New Speeds—up to 35.8 MPH!

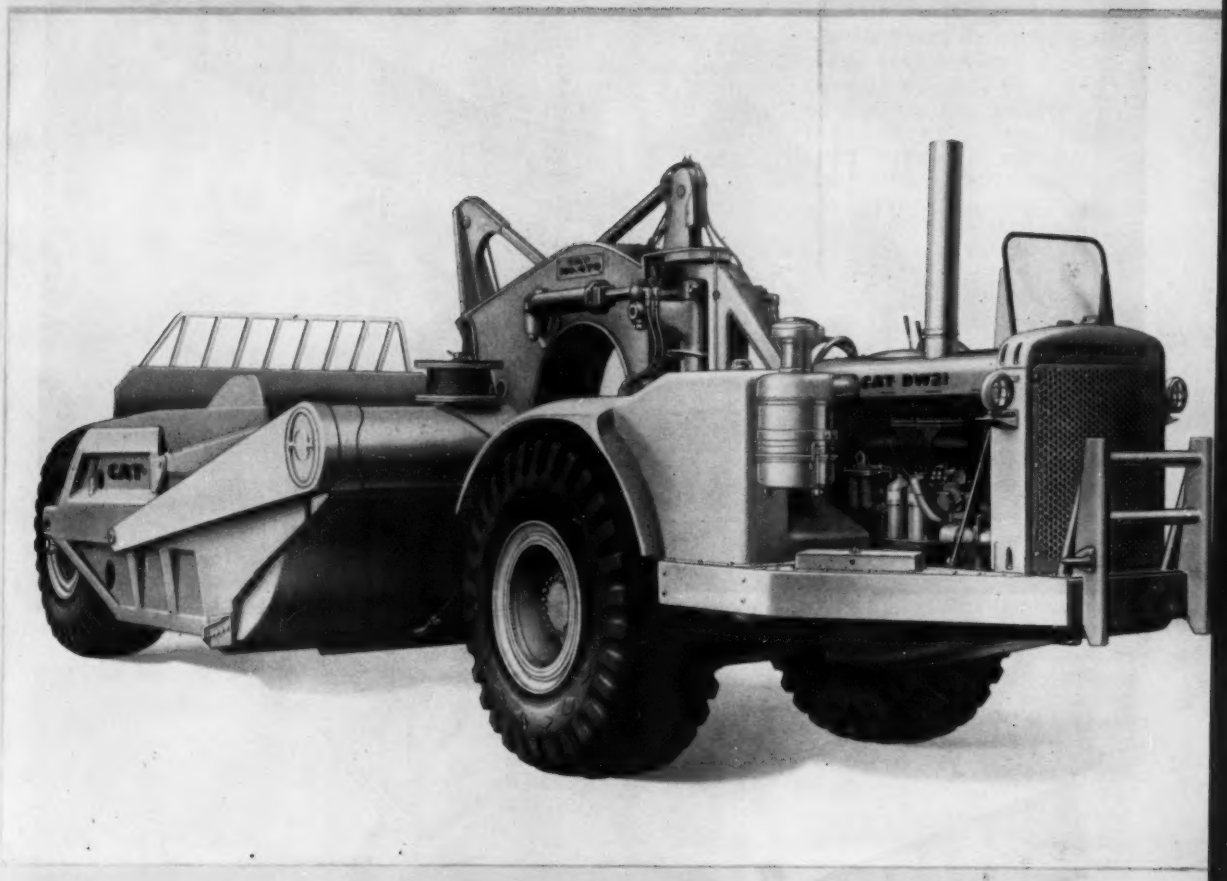
Powered with a brand-new SUPER-TURBO Engine, these big Caterpillar rigs are faster, more powerful than ever. Horsepower of both the DW20 and DW21 is increased to 320. At equal rimpulls, speeds are 10% greater, and torque rise is more than double compared to the previous models. Now you can move earth faster and easier—and still have the dependability for which Cat equipment is famous.

Behind the new performance of the new DW20 (Series F) and DW21 (Series D) is their new SUPER-TURBO Engine. This amazing power plant incorporates a new concept in diesel engine turbocharging. Its heart is a revolutionary air induction system, unique in earthmoving machines . . . and another Caterpillar first.

This system allows use of more of the Turbocharger's potential than was possible before. Results: twice as much torque rise, higher horsepower, better acceleration and gradeability.

But more important, these results translate into faster cycles, greater production and more profit—*for you.*

NEW INCREASED HORSEPOWER



DW21
(SERIES D)

New HP—320 (maximum output)!
New Torque—28% torque rise!
New Speeds—up to 22.6 MPH!

Add to these DW20 and DW21 power advantages all the design features of Caterpillar LOWBOWL Scrapers. These matched units are built to use the greatest possible loading potential of the new power in the tractors.

Higher horsepower! New torque rise! Faster working speeds! Your production will hit new highs and your costs will drop when you turn these improved rigs loose on your job.

Call your Caterpillar Dealer right now and set up a demonstration on a job of your choice. The sooner you see the powerful new DW20 and DW21 in action, the sooner you'll start getting bigger returns from *your* wheel spread.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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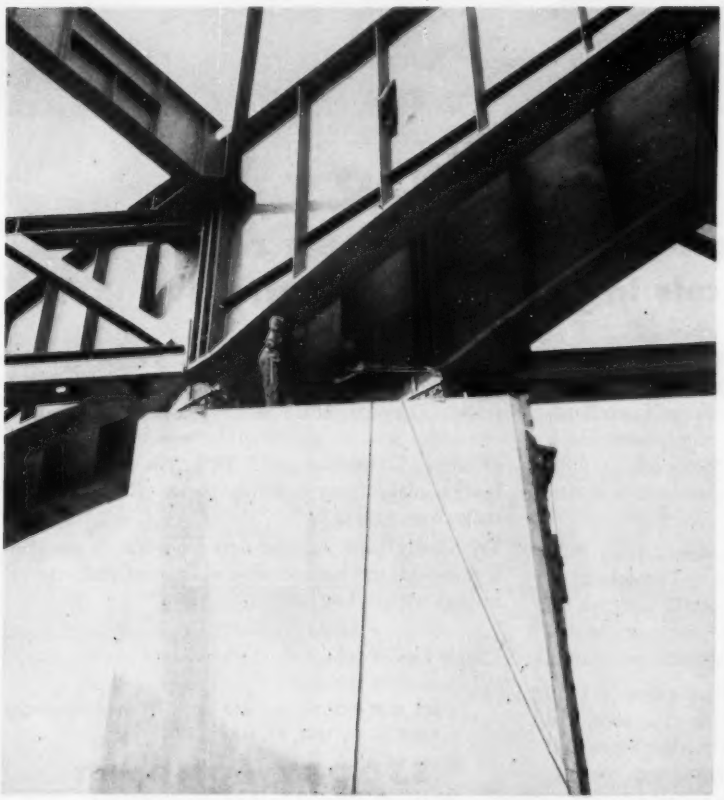
SUPER-TURBO ENGINE
—First in the Industry
—First in Performance

GIRDERS RIDE TIDE... continued from page 88

RAISING SPAN—Jacks raise span in 2-ft lifts to a level about 50 ft above the barge decks. When it is high enough to clear the piers, barges will move it in over the piers.

PLACING SPAN—As tide falls, span settles onto piers. Near end has touched down already. Far end is still above its pier which is 1 ft lower because of highway grade.

MOVING BARGES — Man on Tirfor cable jack helps maneuver barge between piers so span is poised above pier seats. Wind, tide, and short time interval make operation tricky.



FINAL POSITIONING—As girders ease onto piers, crews on each pier pull them to exact position with come-alongs. Careful advance planning results in a perfect fit each time.

to erect the main span. Barge-mounted cranes were not feasible because of a narrow channel and bad mud conditions at low tide. And falsework would have blocked the navigation channel.

J. K. Welding Corp. devised a simple but ingenious plan to overcome these obstacles. They assembled one span on two barges, jacked it up higher than the piers, floated it in over the piers at high tide, and let the falling tide lower it into place. They did the same for the other span.

Three sets of barges moved the spans from fabricating yard to final position. Each span was completely fabricated and assembled in the contractor's Yonkers yards and moved on a 135x50-ft barge in an overnight trip to Cos Cob. The two 136-ton girders of the span plus transverse beams and bracing made a total package of 335 tons.

The 135-ft barge with the girders mounted longitudinally would not fit across the 100-ft channel so, when it reached the site crews shifted the span to a transverse position on two other barges. The span overhung the first barge enough for a pair of 110x34-ft barges to get jacking towers under the two ends of the span and lift it off.

The third step was to float two 200x34-ft railway barges between the second pair and lower the span onto them. The erection crews fastened the railway barges rigidly together by laying two of the heavy floor beams across the two barges temporarily and welding them to the deck.

The span rested on four 14WF119 temporary support columns that held it about 10 ft off the deck. Company engineers positioned these bolsters very carefully so that the barges floating parallel to the river banks in order to fit between the piers would hold the span at the required 37 deg skew.

To raise the span from the temporary supports to pier level the contractor dismantled the four jacking towers on the second pair of barges and re-assembled them around the girders on the railroad barges. Each tower consisted of two 14WF119 columns, bolted to a grillage on the deck of the barge, braced with diagonal channel beams and guyed to the deck.

continued on page 96

(Advertisement)

STOODY 1030

A new, low-cost hard-facing electrode that excels in *POSITION* WELDING!

Here's a new Stoody hard-facing rod especially made to fulfill several "musts"! *Stoody 1030 is unusual in its all-position weldability!* This means easier, faster hard-facing on much larger equipment...equipment which has to be hard-faced in the yard or on the job...equipment which can't be positioned to facilitate a down-hand welding setup!

TOP WEAR RESISTANCE within its price class! Stoody 1030 fits between Stoody Self-Hardening and Stoody 21 in wear qualities, favoring the latter. It satisfies all requirements where good abrasion resistance is essential, at the same time saves several cents per pound.

EXCELLENT COMPRESSIVE STRENGTH adapts Stoody 1030 to such applications as roll crushers; also sides, lips and teeth of power shovel buckets; drag lines and clamshells; carrying scraper blades, runners, etc.

APPLICATION—Either AC or DC, with a choice of straight or reverse polarity on DC. 3/16" rods weld at 140-220 amps, 5/16" rods at 225-275 amps. Straight polarity induces very fast burn-off and minimum penetration. Deposits set up rapidly, easily holding edges of welds. Spatter is negligible; overall application efficiency is approximately 78%. No slag covering results, makes easy multiple passes. Complete size range from 5/32" to 5/16".

Try Stoody 1030 on your next job – test its position welding advantages and wear resistance...make extra savings with its low cost!

Literature on Stoody 1030 is available from your Stoody Dealer (check the Yellow Pages of your phone book) or write direct.

SEE OUR BOOTH NO. 617 AT THE WELDING SHOW APRIL 15-17, 1958, ST. LOUIS, MO.

STOODY COMPANY
11902 East Slauson Avenue
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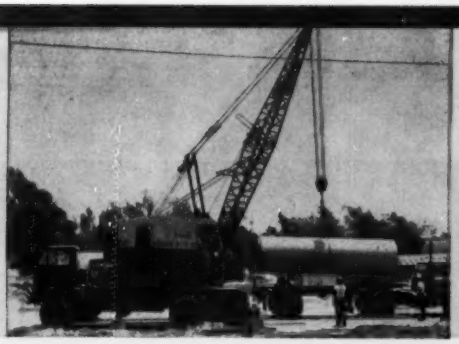
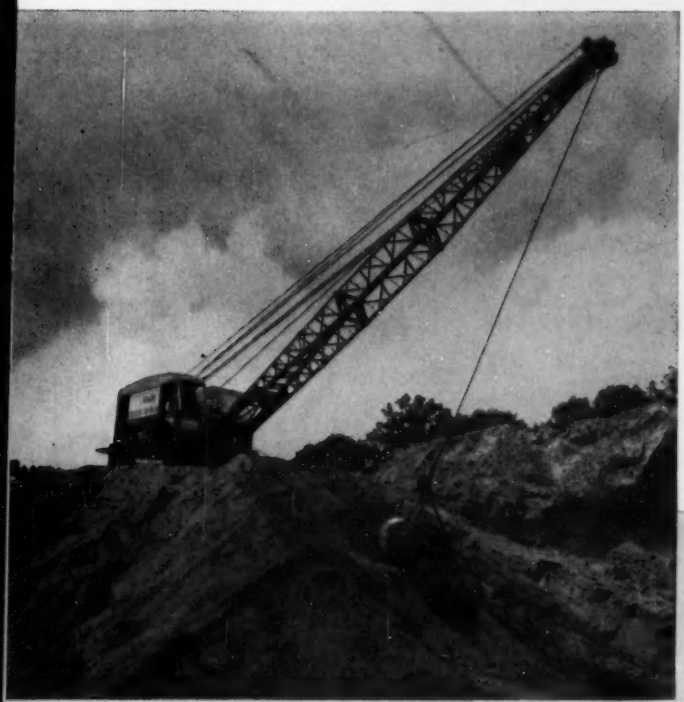


CALIFORNIA—Near Culver City this 30-B Transit Crane handles 48-in. ID concrete pipe for a new water line. The 7-mile system is being constructed to carry Colorado River water to Culver City. Work is maintained at a steady clip despite heavy traffic along a route that includes 14 tunnels from 40 to 300 feet in length. Working with the 30-B are a Bucyrus-Erie 22-B equipped with clamshell and Bucyrus-Erie 38-B hoe.

These Contractors Are Using 30-Bs to Turn Jobs into Profits . . . You Can Too!



More and more contractors throughout the country are making money with new Bucyrus-Erie 30-Bs on their jobs. These men profit from the 30-B's air controls for smooth, big output working cycles; easy servicing and automatic lubrication of many parts that provides more working time; large, cool running clutches and brakes that mean constant response to coordinate every machine function.

You, too, can turn jobs into profits with one of these machines, or any other size in ⅜- through 4-yd. range. Ask your local Bucyrus-Erie distributor for details.

450E58C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

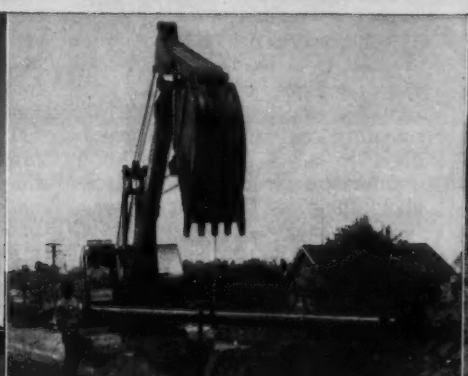
BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

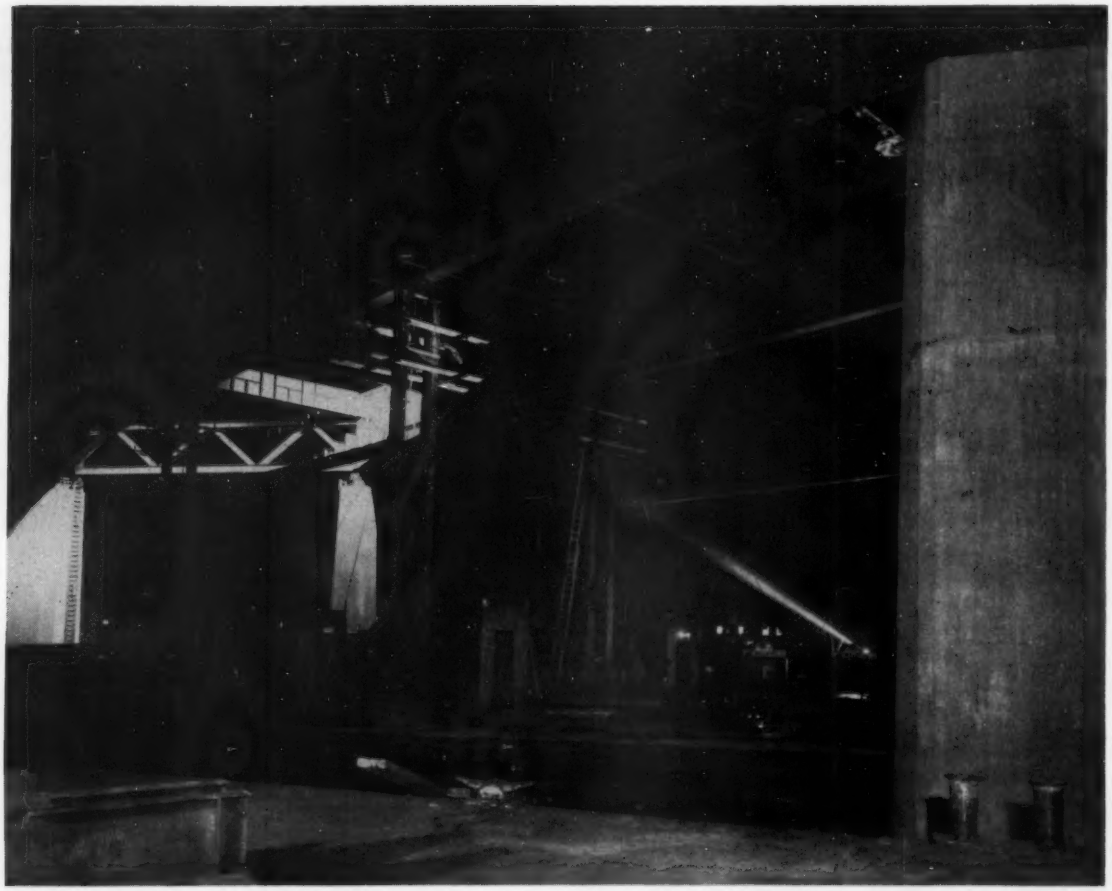
VIRGINIA—The owner liked the performance, economy, and dependability of his 22-B shovel so well that he decided to buy this 30-B dragline. He uses the new machine to remove overburden of dirt from a sand and gravel deposit near Annadale, Va. The dragline also loads sand and gravel into trucks for hauling to road and parking lot construction sites.

MINNESOTA—Equipped with 70-ft. boom, this 30-B dragline excavates in the yard of a paper company in Brainerd. This machine removes sand and clay for the installation of new papermaking equipment. The 30-B was also used to set steel on new plant construction.

WASHINGTON—This 30-B hoe does double duty for its owner during installation of a 15,000-ft. water line for the city of Tacoma. After digging a section of 5-ft. deep trench—and without any change of front ends—the 30-B lowers a section of pipe into the excavation. Trenching is through hard pan, rock, and clay. Not shown but working on the same job is a Bucyrus-Erie 38-B hoe.

CONNECTICUT—Teamed up with a Bucyrus-Erie 22-B shovel, this 30-B dragline dredges sand and gravel to create a 7-acre lake for a housing project near Norwalk. This lake, a narrow stream before the project started, has been enlarged by the removal of over 100,000 yards of material. As the 30-B spoils the material, the 22-B loads it to trucks for removal to another location, where it is stockpiled for use on the owner's other contracts.





NIGHT WORK—Crews work under floodlights to erect the first of two parallel spans. They have to have the span in correct position above piers before high tide begins to fall. Here they are racing against time after floating ice delayed positioning.

On each tower a pair of short horizontal 18-in. channels bolted across the vertical towers carried the jacking mechanism. The jack rested on the lower channel and pushed on the upper channel. The girders rested on the upper channel.

With the lower channel bolted firmly to the uprights the 100-ton air-operated jack pushed the top channel and girder up 2 ft. Then the top channel was bolted in place holding the girder at that level and the lower channel and jack moved up the 2 ft to repeat the process. It took the four jacks about an hour to raise the span 2 ft.

As soon as the girders reached an elevation above that of the piers—50 ft above the barge deck—the barge was ready for positioning. This was the trickiest part of the job. Four men maneuvered the barges between the piers with Tirfor cable jacks on cables from barge to pier.

The big girders high in the air acted like sails in the wind, and river currents and tide added to the complications. Timing was important, too. The crews had to wait until the tide was nearly full in order to get the girders over the piers. Then they had about 1½ hr to get the girders in exact position as the tide began to fall.

On the first of the two big spans, J. K. Welding Corp. scheduled the job for the evening high tide at 6:30 pm. Floating ice in the river, and bitterly cold weather delayed the positioning so that the last few vital minutes were spent under floodlights in a hectic race to beat the tide. For the second span, they chose the morning high tide at 11:00 am, and the erection came off as smoothly as a well-rehearsed play.

Once the girders were poised above the piers, the objective was to lower them as fast as possible before wind or currents had a chance to foul things up. So the crews did not depend entirely on the tide, but jacked them down as well. With the girders starting at about 2 ft above the piers the tide alone would have taken 2 hr to drop this distance. Jacking cut the time to 1 hr.

The bridge is on a grade, and one pier is 1 ft higher than the other. This caused no trouble in positioning the girders, however. The jacks raised them in a horizontal position and then as they settled down one end touched its pier while the other end was still 1 ft above its pier. The jacks continued lowering until this end was also seated. As each end settled onto its pier crews with come-alongs guided the girders for the last few inches.

The columns of the jacking towers had to be dismantled so the barges could get out from under the span. A splice just under the final elevation of the girders allowed for this.

ILLINOIS SETS THE PACE IN *BIG*

★ Here is progress-in-action to meet the fast-moving, ever-changing requirements for large gears in industry.

ILLINOIS GEAR has been meeting this challenge by constantly adding new, modern production facilities . . . the latest of which is the equipment illustrated here. It is the *newest, largest and most modern of its kind in the world.*

Spectacularly large, this precision gear cutting, hardening and testing equipment will handle spiral, Zerol and hypoid bevel gears up to 94" pitch diameter, 13" maximum face, .625 D.P. (5½" C.P.) 2.875" tooth depth and hypoid pinions to 10" offset.

These large precision gears offer new possibilities that may well open new horizons in the design of your equipment. Ask for full information today.

SPIRAL BEVEL GEARS

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up to 94" diameter and 13" face

Look for this mark (ILLG®) *the symbol on finer gears*

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Gears for Every Purpose ... one gear or 10,000 or more

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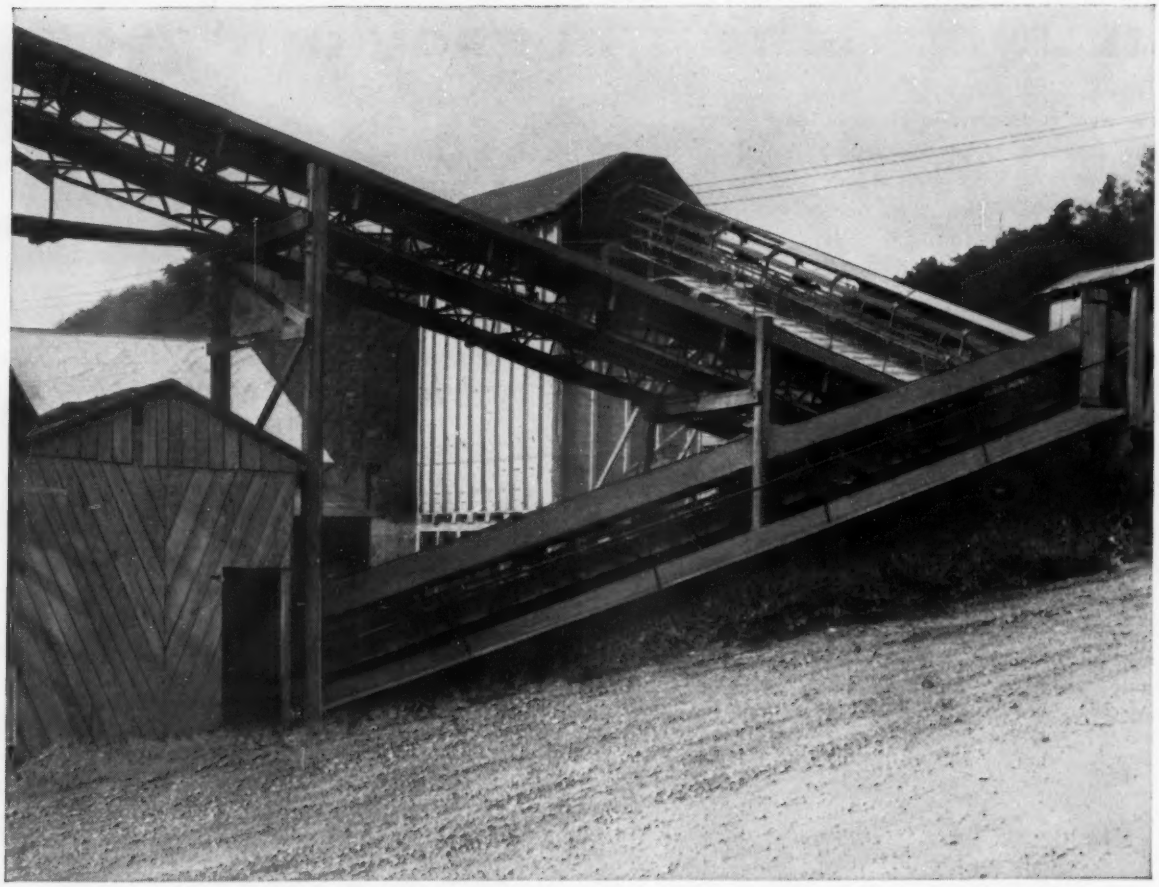

Barber-Greene conveyor idlers and return rolls at this plant have required no repairs since they were installed in 1946.

Original belts and idlers roll on 11 years and ½ million tons later

"Our Barber-Greene conveyors—still equipped with the original belts, idlers and return rolls—have averaged over 50,000 tons of limestone aggregate per year since their purchase in 1946."

That's the report from Landon Vetter, vice president of Vetter Bros., Inc., Oakland, Maryland. He further states: "Our conveyors work an average of 10 hours a day, 5½ days a week, 9 months a year. After their constant service under these conditions, we wouldn't have anything but Barber-Greene conveyors."

Reports like Mr. Vetter's are not unusual because Barber-Greene conveyor idlers offer these distinct advantages: virtually unbreakable, jig-welded base frames . . . self-shedding base angles . . . interchangeable rolls made of heavy steel tubing . . . seamless steel grease reservoirs with Alemite grease fittings . . . 2° tilt to facilitate belt alignment.

Barber-Greene's complete line includes standard troughing idlers and return rolls, flat-belt and picking-table idlers, self-aligning idlers and return rolls, grain idlers, rubber impact idlers and self-cleaning return rolls. Idler widths from 16″ to 60″ with 4″, 5″ or 6″ rolls.

58-8-PE

Write for complete information.

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

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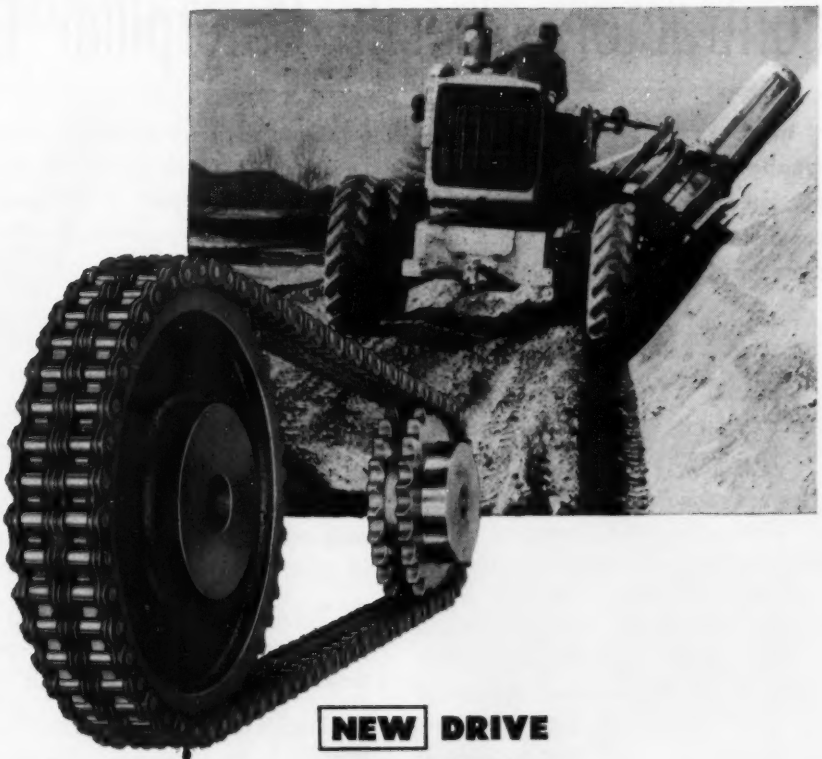


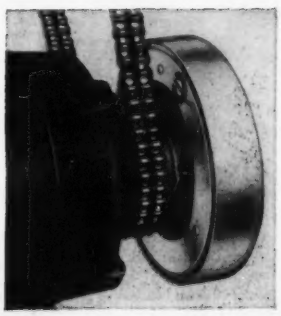
NEW DRIVE FOR COST REDUCTION

Whitney's new, *fatigue-resistant* Processed Roller Chain Drives are cutting equipment maintenance costs everywhere . . . taking the toughest shock loads and punishment that construction schedules can hand out.

Here's why . . . the exclusive Whitney Process offsets *excessive operational stresses* in the chain — assures new durability and freedom from downtime. Every chain component is designed, heat treated and assembled to meet your specific service standards.

Another important design advance is Whitney's High-Capacity Roller Chain. This new, *compact* chain drive may provide the solution where space limitations and higher horsepower requirements are important factors in power transmission.

Whitney Field Engineers will gladly provide practical recommendations on all of your chain and sprocket design problems. And you can rely on your nearby Whitney Chain Distributor for fast service from a complete line of ASA roller chains, conveyor chains and stock sprockets.



Heard About Whitney-Tormag Magnetic Drives?

For complete motor overload protection, cushioned starts and high efficiency, ask about our new permanent magnet, self-contained power transfer unit. Available in 1 and 2 H.P. units as stock items, additional sizes up to 15 H.P. will follow . . . Write for literature.

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(Advertisement)

Why contractors specify Caterpillar Engines

Old hands at the business know from experience that dependable Caterpillar Diesels, built for high production performance and negligible down time, cut costs you can measure and help get the job done now.

Wherever you see an experienced contractor handling a tougher than usual job, you will also see Caterpillar Engines and Electric Sets used for primary and auxiliary power. It's getting to be standard practice.

CAT Engines are economical to operate. They start easily and stand up under the roughest going. The special metals and superior workmanship which go into their manufacture mean negligible down time, and this in turn means that your other equipment on the job won't be idled because a key machine has to be repaired. That's why you often see reliably rated Cat power units widely used on a single job—powering a combination of cranes, ditchers, cement batchers, auxiliary lighting—the works. And for the same profit-making reasons, you find a growing preference on the part of the job-wise contractor for Cat Engines to *repower* equipment that's short on day-in day-out guts.

Developed as the first tractor-diesel engine, these same basic characteristics—from smooth lugging without fouling to the ability to idle for long periods—make Cat Engines of today first choice to power and repower the contractor's valuable equipment. Particular attention is always paid to durability, a trouble-free fuel injection system able to handle a wide range of fuel, and to maximum protection for its fuel, air, oil and water.

Take time now to save down time later—call your nearby Caterpillar Dealer and find out what these power packages will do for you.

Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U. S. A. Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

A dependable Cat D318 Engine furnishes power for the operation of this Parsons trencher, and a pair of D311s work the Insley cranes in the background. The Mainland Construction Co. of Texas City, Texas, is handling this new housing project, and Clyde E. Smith, partner, says, "We can bid the jobs cheaper when we have good equipment that gets the job done. During the five years we have been in business we have never lost an hour's time due to failure of Cat-built equipment!"

for original power and repowering

C. J. Langenfelder & Son, Inc., relies on a heavy-duty Cat D397 Engine to power this Lima shovel, loading out slag material for use on runway extension and widening job at Middletown Air Depot, Middletown, Pa. Cat DW20s and a Cat D8 Tractor are also on the job. This spread's Equipment Superintendent, LeRoy A. Marquis, says, "You can't beat Caterpillar power — economical to operate, low in down time, dependable to the nth degree!"

Construction is under way on a canal 85 feet wide and 9 miles long through a 1,200-lot subdivision. This pleasure boat waterway is being constructed with 2 Bucyrus-Erie 15-B draglines powered by Cat D315 Engines. Owner Cuyler L. Lanier of Tavares, Florida, says, "Cat Engines and equipment turn out more work and are more economical to operate than similar machines."

Russ Mitchell, Inc., of Houston, Texas, repowered this Austin ditcher with a Cat D13000; and a Koehring clamshell on the job is powered by a D318. Job is trench work for a storm sewer. Said E. C. Cowart, Job Superintendent, "For my money Cat makes the best equipment in the dirt-moving business. I like the dependability of their engines when the going is tough!"

ENGINE POWER BY CATERPILLAR

Piston assembly built of separate metals for longer life. Lightweight aluminum alloy pistons keep bearing loads at a minimum. Cast-in iron top ring band prevents undue side wear of ring groove. Wear-resistant chrome-faced top ring maintains good oil control. A stainless-steel heat plug prevents excessive erosion on piston top in all high-output engines.

Engine Division **Dept. CM4**
CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.

Send me more information about Cat Engines for original power and repowering.

☐ Have your dealer call for an appointment, as I may be in the market for a Cat Diesel Engine or Electric Set. I understand that I am under no obligation.

☐ I am interested in learning more in general about these engines.

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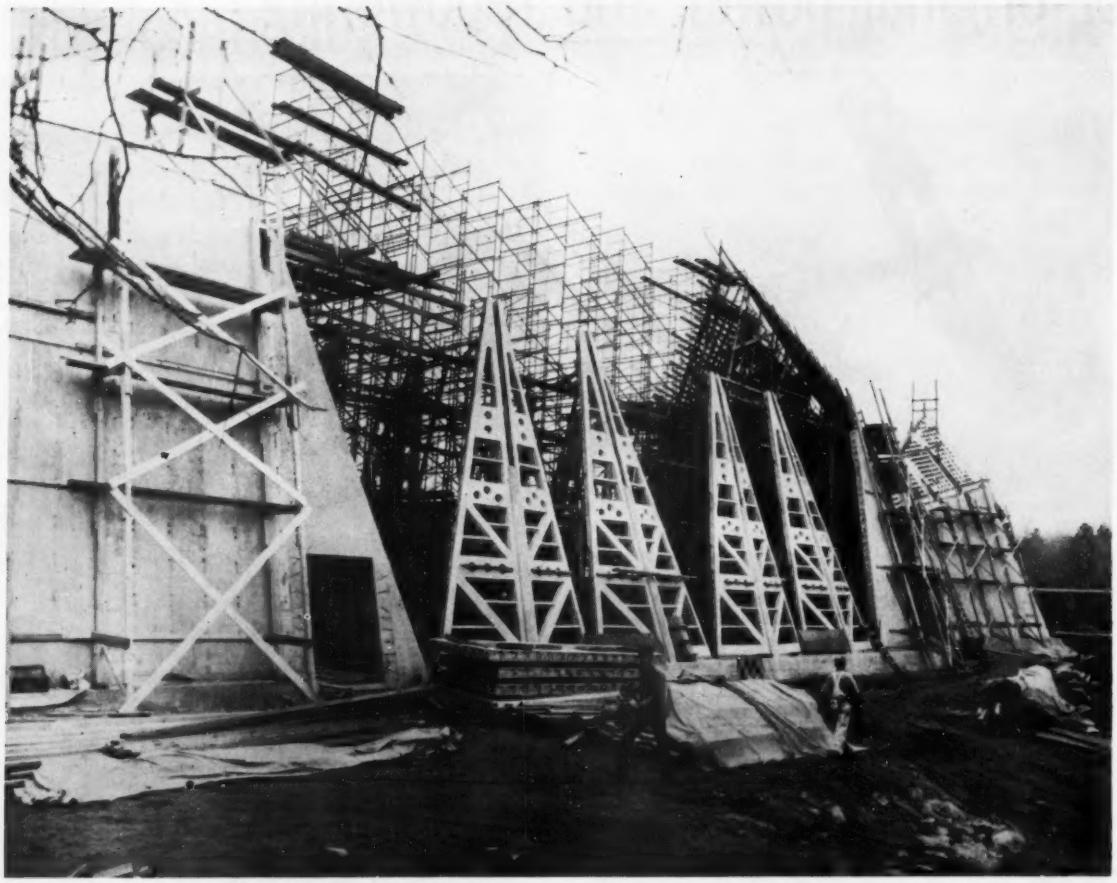
Company _____

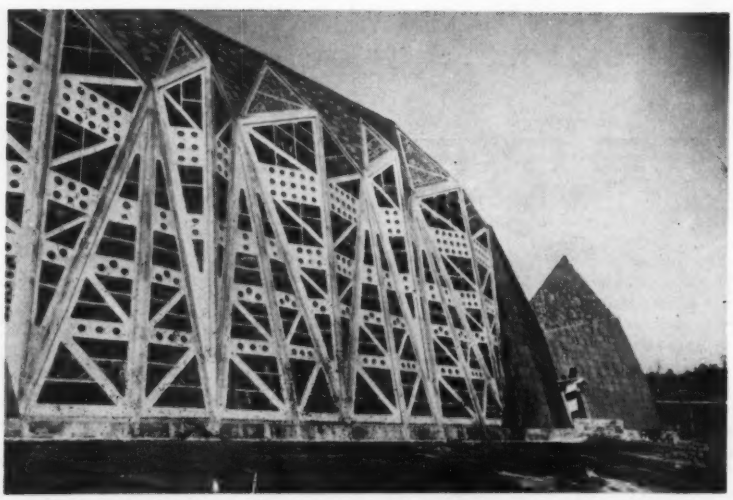
Address _____

City _____ *Zone* _____ *State* _____



PANELS IN PAIRS—Right triangles back-to-back along sides of church form saw-tooth pattern into which pairs of up-ended triangles fit. Maze of scaffolding supports spreader beams that cross building to brace opposite wall panels and cradles roof panels.

Joints Between Precast Panels



DIAMOND PATTERN—Intricate arrangement of triangular panels created a tough layout problem. Panels had to be placed within 1/8 in. of plan location to get proper fit.

PRECAST CONCRETE PANELS —some of them triangular, others quadrangular—fit together like the pieces of a jigsaw puzzle to form a striking new church building in Stamford, Conn.

The panels vary in size as well as shape (the biggest measure 36x10 ft). The wall panels lean inward at an angle of 14 deg from the vertical and at the top meet tilted roof panels to form a gabled arch. The panels enclose a sweeping space unbroken by interior columns or beams. The concrete joints between panels form a lattice that is the structural frame.

Resembling a huge fish in shape, the church building is part of the religious center of the First Presbyterian Church in Stamford. The fish is an ancient Christian symbol.

POURING JOINTS—Workmen place cement-rich concrete from bucket of tractor shovel into 8-in. gap between panels. Sliding forms are brought up day by day in 5 ft lifts.

Frame Church

In plan the church is roughly a diamond with one end stretched out and the tip chopped off. Tacked onto the other end is a fan-shaped addition covered by a jutting roof that forms the tail of the "fish." The sloping roof over the main portion of the church reaches a peak 60 ft above the floor at the widest point. This width is 54 ft; total length of the church is 235 ft.

The unusual design made a challenging job for contractor Pat Deluca, head of Deluca Construction Co. of Stamford. In his words, it was this way: "Biggest problem was placing the panels in correct position and holding them there until the joints were poured and the structure became self-supporting. Accurate layout was the first "must" on this job. The panel sections come together at odd angles—there are no right angles in the building—and if one panel was slightly out of line, the others wouldn't fit. Another problem was the extensive falsework and bracing needed to support the panels. Altogether the job was a real challenge."

Precast Building Sections, Inc., of Long Island, N. Y., fabricated the 152 panels for the church. There are 72 triangular and 80 quadrangular panels. The large triangles that go into the side walls are open grids that frame the richly colored cut-glass windows. The quadrangular panels that enclose the end sections of the church are solid slabs 4½-in.-thick.

Both type panels are edged by beams that run along each side. The triangular panels are cast with an 8-in.-square perimeter beam. A 12-in.-square beam is cast around the perimeter of the solid quadrangular panels. These edge beams are spliced together by 8-in.-thick concrete joints to form the massive concrete ribs that are the backbone of the structure.

The edge beams are heavily reinforced. Four heavy bars run the length of each beam. Lighter reinforcing placed at right angles to these long bars protrudes from the beam in two rows and serves primarily as dowels that lace adjoining panels together. They are wrapped around the reinforcing bars—usually four in number—that run along each joint between edge beams. The joint reinforcing is tied together where joints intersect to make the structural ribs continuous.

Joint concrete is keyed into the perimeter beams by a row of 6x6x1-in. pockets set into the edge of the perimeter beams. In addition, steel plates project from the edge beams of the triangular panels to be welded to similar plates on the adjacent panel.

Precast had to form all but six of the panels individually. The use of Incor high-early-strength cement allowed them to strip forms the day after pouring. And with three casting beds available, production moved along smoothly. Fabrication of all 152 panels took only about six months. The finished panels were trucked 60 miles to the job site.

Deluca began construction at the site with a Lorain backhoe digging out a trench for the concrete footings that support the wall panels. The 4-ft-thick walls extend down to bedrock, which varies in depth from 3 to 28 ft. Besides this perimeter trench, a ditch also was cut across the width of the building for a massive 12x14-ft beam that ties the walls together to prevent outward movement from the thrust of the inclined wall panels. Another trench followed the center line of the building to house the concrete-encased conduits that feed heat through cores in the floor slab. Except for a small room under the fan-shaped addition, this completed excavation for the building. The contractor then placed and compacted a gravel fill and poured a 9-in. hollow floor slab to complete foundation work.

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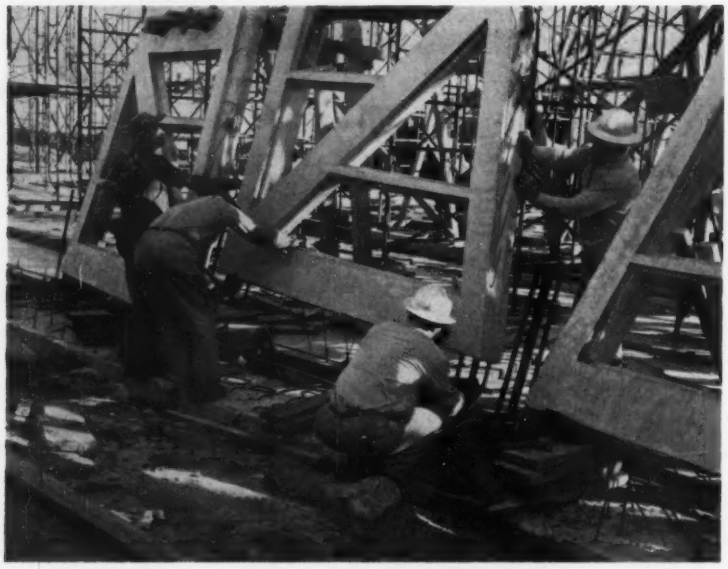
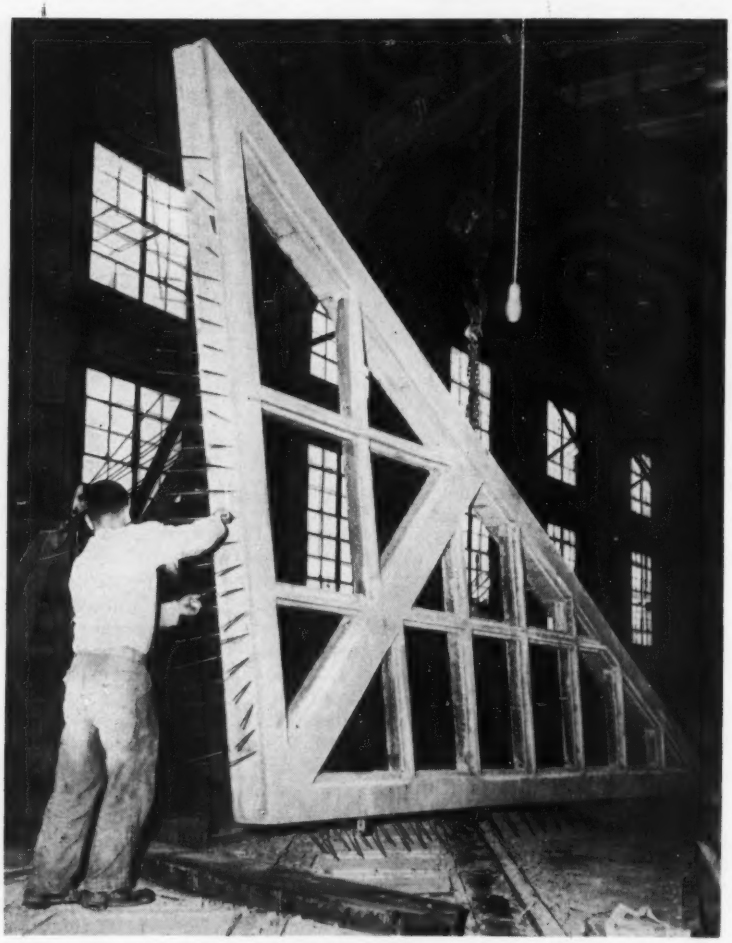


ANCHORING—Workmen guide panels into place so that anchor bolts protruding from top of footing wall fit through holes in bearing plates attached to edge beam reinforcing.



CASTING—Reinforcing steel protruding from edge beams will be laced across joints to tie adjacent panels together. Precast Building Sections, Inc., cast all 152 panels.

Next Deluca erected an extensive falsework system to support the precast panels. He set up Waco steel scaffolding covering the entire floor slab and reaching up to the roof line. The scaffolding is designed primarily to carry the facing forms that cradle the roof panels, but it also supports a row of timber temporary spreader beams that span the width of the building to brace a panel in each side wall. These spreaders hold the panels apart at a heighth of about 30 ft above the floor. Temporary raker beams bearing against the floor slab shore each wall panel at three levels to insure stability.

Now Deluca was ready to tackle the painstaking job of erecting the panels. Since each panel had to be placed within ⅛-in. of exact plan location, an elaborate control system was necessary to get this close fit. A set of coordinates provided by the consulting engineer, F. J. Samuely of London, England, fixed the position of all joint intersections.

To check these points during erection, the contractor established control points on the floor slab by taping from a base point at one corner of the building. Starting from this base point, he laid off the first coordinate along a base line that was an extension of one of the side wall lines. Then he laid off the second coordinate perpendicular to the base line to establish the control point. The position of each joint intersection was then checked as erection proceeded by plumbing down from the corners of panels to these control points on the floor slab.

Along the sides of the building, the triangular panels with their base downward were placed first. A 35-ton Lorain crane lifted these right-angle triangles into position in pairs so that their vertical sides were back-to-back 8 in. apart. Pairs of up-ended triangles fitted in the saw-tooth gaps between the pairs of upright triangles. The panels were placed in opposite positions in the two side walls at the same time to balance the load on the bracing.

At each bottom corner of the upright triangles bearing plates are welded to the four reinforcing bars that extend beyond the end of the edge beams. Workmen guided the panels into position so that anchor bolts cast in the top

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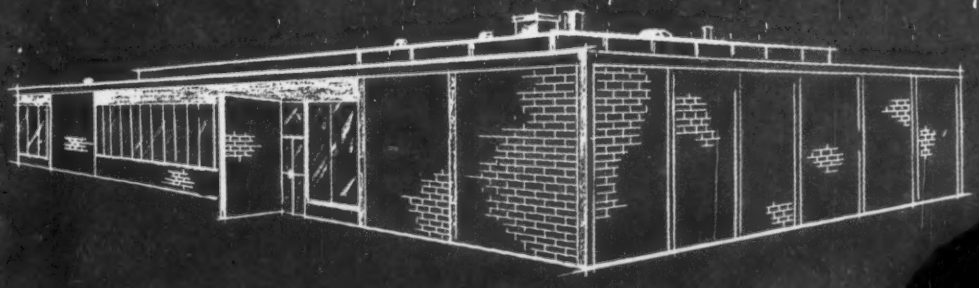

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PROJECT: Office and warehouse, Reinhard Bros. Co. St. Louis Park, Minn.

ARCHITECT: David Griswold

MASONRY CONTRACTOR: Kraus-Anderson, Inc. Minneapolis, Minn.

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says R. J. Randolph, Mason Foreman
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- To produce serviceable, watertight masonry walls, the mortar mix must be plastic—and have adequate "board life."
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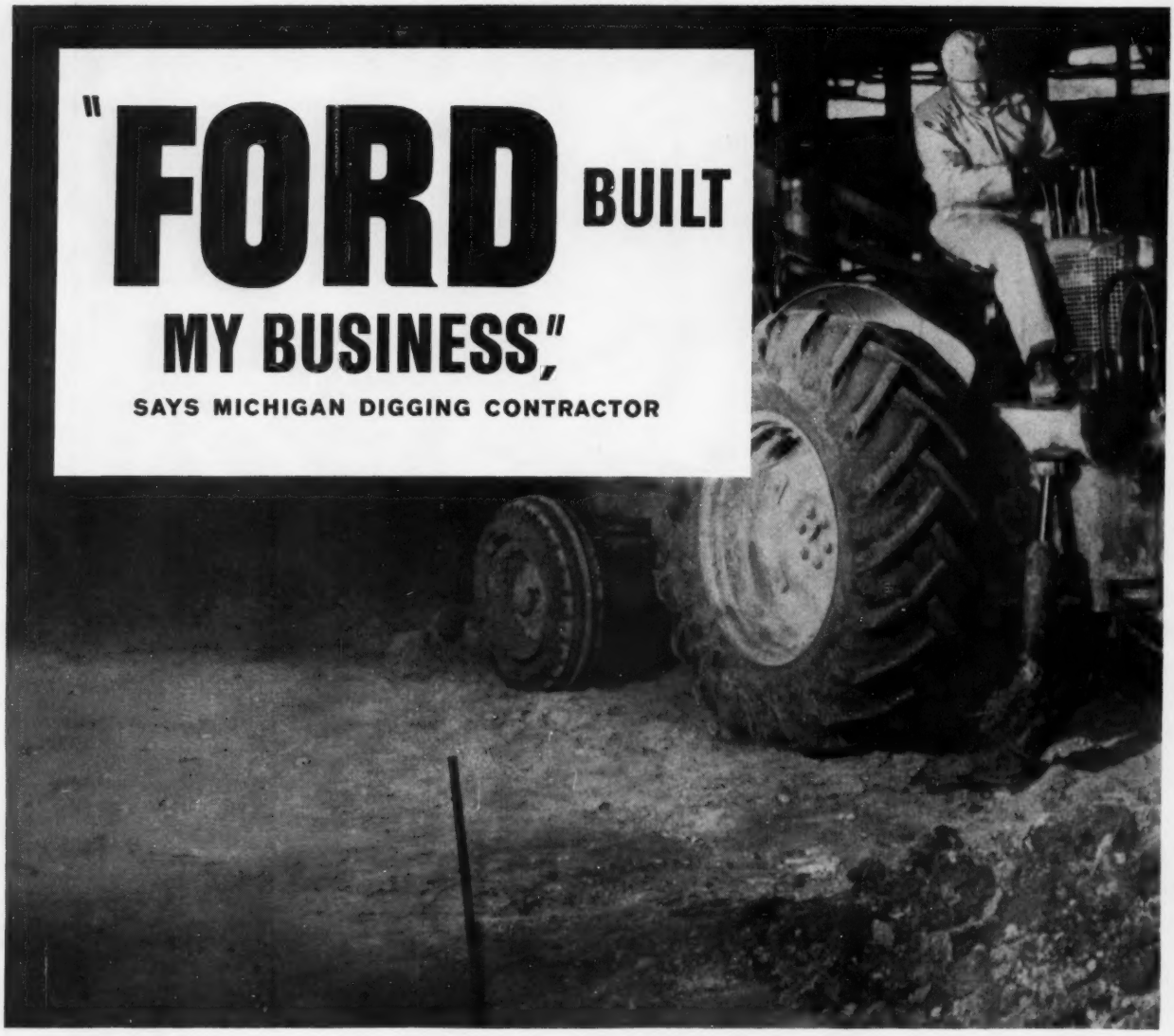
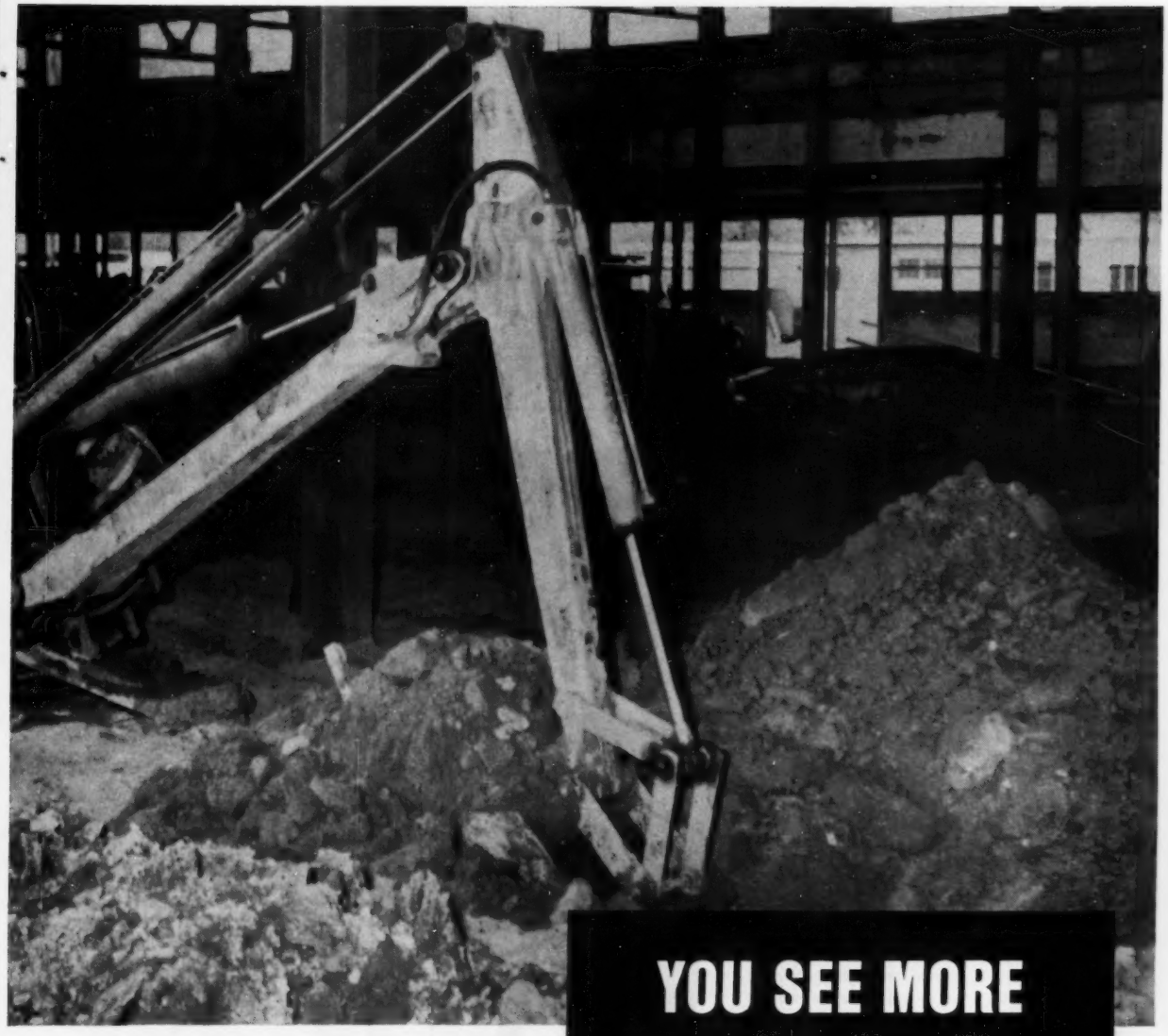


From a single Ford Tractor to a $120,000 equipment fleet

28-year-old Burrell Burke of Flint, Michigan, contracted his first digging job 4 years ago with a second hand Ford Tractor, blade and loader. Today his digging-trucking firm employs 12 people and owns four Ford Tractors, a Fordson Major Diesel Tractor and a dozen trucks. The company digs sewers, footings, laterals, machine pits in factories, tornado shelters, basements—"anything that needs a hole."

Couldn't "Kill" first FORD—"Business tripled the first three years and doubled again last year," says Mr. Burke. "We've been working all kinds of jobs, big and little. But no matter what the job is, I've never seen anything like those Fords for taking punishment. I never did kill off my first one. It slogged through jobs where my main problem was keeping mud out of the fan. I used it until I was ashamed of myself before I traded it in on a new one."



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Many model Ford Tractors now available with Gasoline, LP Gas and Diesel Engines.

of the footing wall passed through holes in the bearing plates. Two nuts—one on top of the plate and one beneath—were then adjusted to level the panel. Workmen clambered over the scaffolding to check the position of the upper corner by plumbing down to the control point marked on the floor slab. Then bracing was adjusted to hold the panel securely in this final position.

The up-ended triangular panels were slightly more difficult to erect. They are not supported by anchor bolts, but are held entirely by the joints with adjacent panels. The crane held each of these panels in place until the dowel bars and connection plates were welded together and the bracing carefully blocked in place.

The solid quadrangular panels in the end sections of the building were placed in the same way, except that they rest directly on a step in the top of the footing wall. They are clamped in place with brackets that prevent lateral movement.

When several adjoining panels were in place, Deluca began pouring the joints. Particular care in this operation insured high strength in this critical part of the structure. Extra cement and thorough vibration kept compressive strength of the joint concrete well above the 3,500 psi called for by the specs.

The joints were brought up a little at a time each day. A sliding form about 6-ft-long clamped to the edge beams was carried up on the outside face until the joint was complete. A key about 2-in. deep linked the separate pours, and with the four heavy longitudinal reinforcing bars made the joint continuous.

Only a small amount of concrete was poured each day, usually no more than 1 yd. A Rex one-bag mixer supplied this small amount. Workmen placed the concrete with hand shovels from the bucket of a Michigan tractor shovel in the lower 20 ft or so of the joints between wall panels. A crane with small concrete bucket supplied the concrete for the higher sections.

With all panels in place and the joints poured, the structure was self-supporting, and the falsework could be dismantled. But more than one veteran construction man held his breath as the bracing fell away. Despite the assurance of the engineers that the structure was stable, some of the men—including Deluca himself—were skeptical. They figured that there should have been some permanent bracing in the peak of the roof to prevent buckling at the knee. Everyone was pleased and relieved at the results—not even a crack.

The building took two years to complete. Major work halted in the winter because cold weather might have impaired the strength of the joints.

Architect Wallace Harrison, director of planning for the United Nations buildings, regards this church as his most significant achievement. Bringing the daring design into reality has been a tough but satisfying experience for contractor Pat Deluca. "We didn't make any money on this job," he says, "but we got such a bang out of the challenge that it was worth it."

Wanted... wanted... wanted! – Every day for a long time now we have seen demands growing for a lighter submersible pump with capacity for heavy duty service, yet easier to move, easier to carry. Now that we have got it for you, WE WANT the best way of placing it on the US market!
Here it is – the WEDA one-man-carry, selfpriming 3-inch electric submersible pump. It weighs only 86 lbs., performs like pumps double its size. It's designed and built by Wedaverken, of the Bofors Group – known the world over for Swedish quality products.

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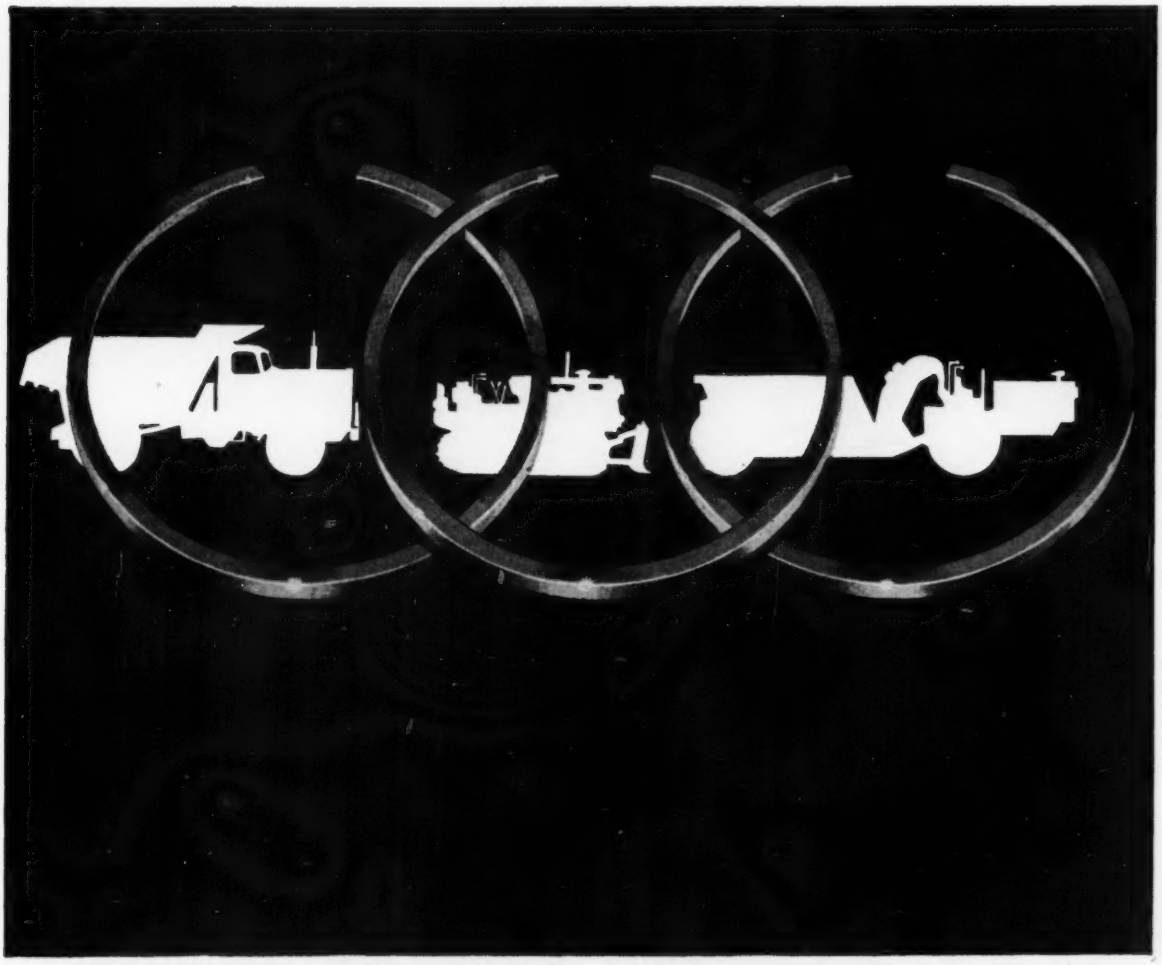

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Estor D-3 is a heavy-duty detergent oil formulated to meet the rigorous demands of late-model, supercharged diesel equipment requiring a "series 3" lubricant. Even under the most extreme operating conditions, it resists the formation of dangerous hard carbon deposits. As a result, rings are protected from cracking and other deposit-caused difficulties, and an effective seal is maintained between pistons and cylinder liners. This means *maximum power and fuel economy with minimum wear* – and longer periods between overhauls, lower operating costs.

The high-detergency of Estor D-3 acts full-time to reduce crankcase sludging and to keep all moving parts free from gum and other deposits that can become hard and troublesome. Also, Estor D-3 removes light gum deposits that may already have formed and protects bearings from corrosion.

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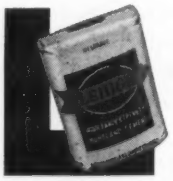
DELAWARE HIGHWAY DEPARTMENT SELECTS PRESTRESSED CONCRETE FOR NEW BRIDGE...

(*Above*) Placing the last of the first five spans of the new Fenwick Island Bridge. There will be eleven spans in all with a total length of 440′. Box beams are 39′ 11″ x 3′ wide and weigh about 10 tons. Each span requires 13 beams.



Owner: Delaware State Highway Department

Designed by: Bridge Division, Delaware State Highway Department

Contractor: George & Lynch, Inc., Wilmington, Del.

Prestressed Beams Manufactured by: Eastern Prestressed Concrete Corporation, Line Lexington, Pa.

(*At right*) Moving beam from casting bed in background to stockpile, early in the morning at manufacturer's plant. Beam was cast the previous day.

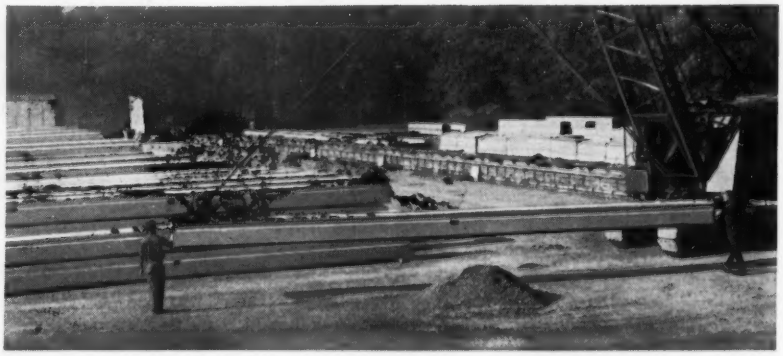
This new bridge links Fenwick Island with the mainland in the famous Delaware-Maryland Seacoast area. Its spans are prestressed concrete, chosen by the Delaware Highway Department for quicker, more convenient construction, at lower costs.

Precast to exacting specifications at the manufacturer's plant, the box beams were trucked to the job site as needed. Beams were quickly lifted from the truck and swung into place by crane—making it easy to place a span of thirteen beams a day.

In manufacturing these beams, Eastern Prestressed Concrete Corporation used Lehigh Early Strength Cement to gain maximum production efficiency. With the concrete reaching 4000 PSI in 18 hours, it was possible to make 8 beams every other day using only one 345′ casting bed.

This is typical of the advantages of Lehigh Early Strength Cement in modern concrete construction.

LEHIGH PORTLAND CEMENT COMPANY Allentown, Pa.



Edward Gutschmidt, *Fleet Superintendent*

USES CLEVITE 77, SAYS...

'We have yet to find a better bearing!'

In rugged Oregon territory, this carrier relies on Clevite 77 for road rigs and city trucks, runs main bearings 400,000 miles, rod bearings up to 225,000.

The road rigs of Bend-Portland Truck Service travel from sea level to 4000 feet, average 100,000 miles every year in temperatures ranging from 30 below to a scorching 110. Yet their fleet superintendent is able to say, "We never worry about bearings until there is some other work to do on the engine. We just don't have bearing trouble."

Cost-conscious fleet operators everywhere have learned that Clevite 77 is the finest high-duty engine bearing obtainable. Patented tri-metal construction provides greater fatigue strength, corrosion resistance and a superior running surface.

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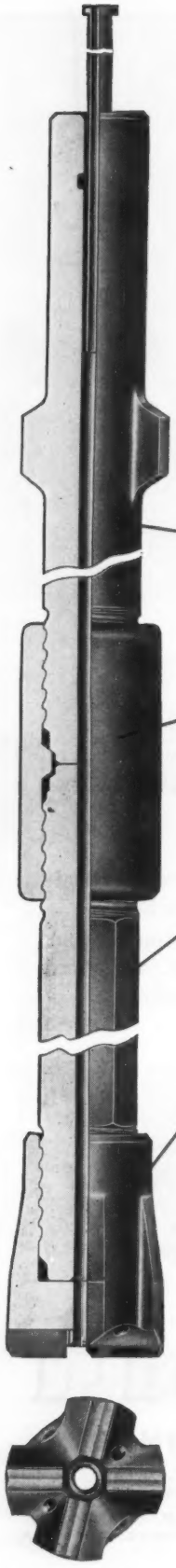

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CARBURIZED SHANK PIECE gives extra strength and wear resistance where it's needed most. Fast, easy and economical to replace. Eliminates need for costly shop equipment to upset and shank hex steels. "O"-ring seal permits high pressures for dry or wet drilling.

MATCHED SEMI-BRIDGE COUPLING assures proper alignment between sections. Drill deep holes without pulling and changing steels. Unscrew shank piece, couple on a new steel section and keep right on drilling. Available threads include new I-R Type 22—designed for maximum ease of detachment so important in deep hole work.

CARBURIZED ALLOY-STEEL RODS of hex section and extra large hole for better hole cleaning...threaded at both ends to match coupling and bit. Eliminates need for extra adapter between bit and rod. Right combination of strength and hardness for maximum footage.

CARSET BITS WITH CARBOLOY* CARBIDE INSERTS a super tough grade especially developed for rock drilling. Threads, inserts, shoulder and skirt all correctly proportioned for best rock performance. Rifle-resisting "X" design in sizes 2½" and up, permits highest sustained drilling speeds.

THREE DIFFERENT THREADS AVAILABLE

TYPE	DESCRIPTION	BIT SIZES
22	1¼" OD thread, 3 threads per inch	2"-2⅛"-2¼"
40	1¼" OD thread, 3½ threads per inch	2"-2⅛"-2¼"
60	1½" OD thread, 3 threads per inch	2½"-2¾"-3"-3½"

This ALL I-R deep-hole drilling combination has repeatedly proved its ability to stand up on the toughest jobs—give maximum footage per shift and cut the overall cost of drilling rock. For complete information, or for an eye-opening trial order, get in touch with your Ingersoll-Rand man as soon as possible.

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A CONSTANT STANDARD OF QUALITY

Better Rigs Spark Advancements in Bituminous Paving

In no other area of construction have equipment and techniques changed as rapidly as in the bituminous paving field. Compaction machinery and methods have improved tremendously in the past few years; asphalt plants turn out huge hourly tonnages at the flick of a switch; modern pavers lay down material at rates limited only by specifications. As a result, contractors now are placing an average of 15,000 mi of high-type bituminous pavement a year.

As Chief of the Division of Development of the Bureau of Public Roads, J. A. Radzikowski (above) has followed advancements in the bituminous paving field closely. Recently he summed up many of the important improvements in a speech delivered to the Asphalt Conference held at Iowa State College, Ames, Iowa. This article is based on excerpts from Mr. Radzikowski's speech.

WHENEVER A PRODUCT is as widely used as asphalt and other bituminous paving material, there are bound to be new and improved tools and methods developed for its application. In essence, this is my subject: "What's New in Equipment and Construction Methods in the Bituminous Paving Field."

When we speak of a pavement, particularly one of the bituminous type, it is difficult to discuss the wearing course without referring to the base and intermediate courses. Accordingly, I will cover the entire pavement structure, including the foundation.

One of the newest equipment developments, which will be of considerable value for utilizing poor grade local gravels, is the aggregate upgrading machine. This process makes use of the fact that objectionable soft particles have substantially different elastic or bouncing properties from hard, durable stones.

Stones taken from the pit are conveyed into an overhead bin from which they are transferred by gravity to a vibratory feeder. The stones then are delivered from the lip of the feeder in a controlled manner so that they drop in a required pattern on the surface of a large inclined steel plate. Hard stones bounce in such a manner as to produce a characteristic distribution curve. The softer stones will also fall into a consistent but different curve pattern with a shorter arc.

Bounced stones are collected into three separate compartments with stones of similar elasticity going into the same bins. The compartments are separated by adjustable dividers.

Our investigations reveal that this equipment shows excellent promise for the upgrading of gravels that do not contain cherts. Beneficiation costs are reported at 4 to 5 cents per ton.

Another very recent equipment development that should be of considerable assistance in bituminous paving operations is the electronically controlled fine grader attachment for a motor grader. This device keeps the grader blade level or at a desired crown slope despite irregularities encountered by the grader wheels.

When used on subgrade, base, and bituminous paving courses, the device reduces the time and cost of producing finished grades by from 25 to 75%; reduces the cost of grading stakeout by from 50 to 80%; produces a measurably smoother surface when the paving machine travels on the graded surfaces; and permits more accurate crowning of road mix surfaces.

Improved Compactors

Several significant advances have been made in recent years in compacting equipment for bituminous surfaces and their supporting foundations. Multiple pad-type vibrators with either electrical or hydraulic vibrating units have been used extensively for compacting subgrades, macadam, and granular base courses with outstanding results.

Only last year a roller manufacturer added several vibrating pads as an attachment to a three-wheel roller. The vibrating unit is suspended from the rear of the roller and can be lowered from the travel position hydraulically.

Tests show that 102% of standard density was achieved on a stabilized base section in one pass with this attachment. This compares with the 88% of density obtained with one pass of the roller alone.

Other compacting equipment that employs the dynamic force principle includes towed and self-propelled vibratory rollers. The towed types have been used principally on subgrade and base compaction, and good results have been reported. One of the factors that has retarded a greater use of vibratory rollers is the lack of a suitable self-propelled model.

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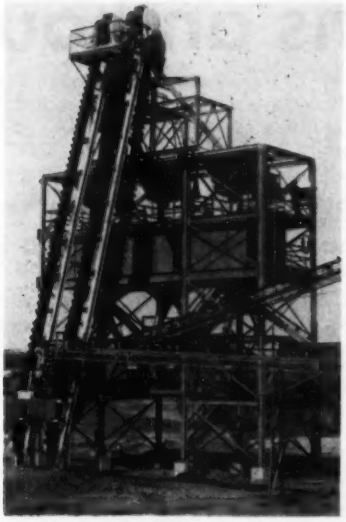
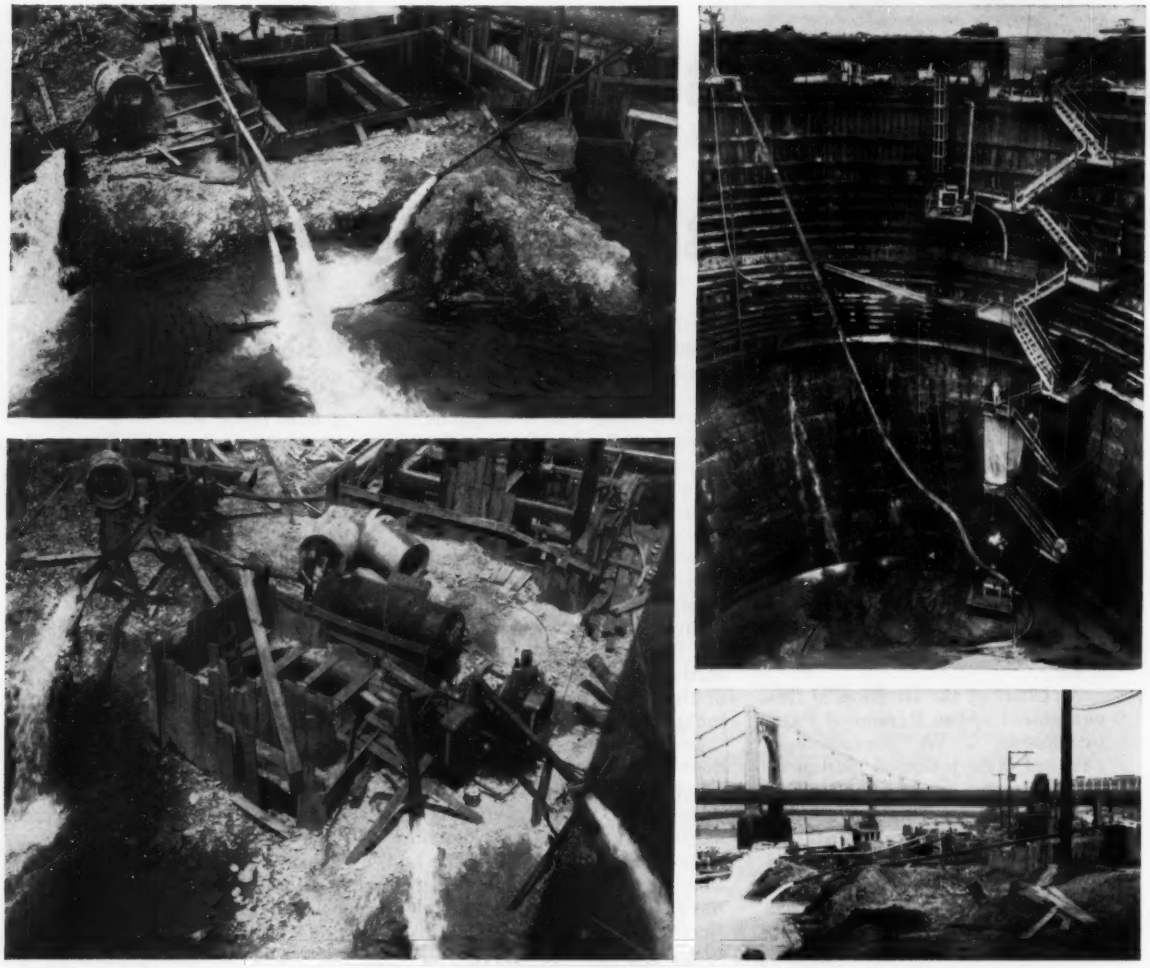


GRADES GRAVEL—Blaw-Knox's new plant grades gravel by dropping stones on steel plate. Hard stones bounce farther than soft ones, are collected in bin.



Four of the many pumping operations on Pittsburgh project. Riverside location meant handling heavy inflow.

Over 2 million gallons an hour with Jaeger pumps

For both low and high head pumping, 7 of the contractors on Pittsburgh's new $100 million sewer system used 51 Jaeger pumps with a total water handling capacity exceeding 2,000,000 gph

A Jaeger "Sure Prime" pump has four things that you don't get in ordinary pumps—a bigger shell and impeller, an engine of the largest horsepower applicable, a positively lubricated shaft seal and two independent, simultaneous priming actions.

As a result you get doubly-sure fast priming without racing your engine, big capacity at much slower operating speed, high efficiency and longest life from both pump and engine. *Base your pump buying on today's performance.* See your Jaeger distributor or send for latest catalog.

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Veteran bridge contractor reports...

"Equipment move-time cut 50 to 75% with LaCrosse 'RG' Trailer!"

"Because we drive *right over the front end* of our new LaCrosse removable gooseneck trailer — without planking or special ramps — we can load and unload heavy equipment in *half the time* required with standard low-beds," reports R. L. Stevenson, Engineer-Secretary of A. Olson Construction Co., Waterloo, Iowa. "In fact, we *cut loading time at least 75% in winter* because we don't have to contend with slippery, frost-covered planks."

According to Stevenson, the 25-ton LaCrosse "RG" is the perfect answer to two major problems. It *cuts non-productive move-time* to a minimum . . . also permits *better scheduling* of men and machines, for increased job efficiency.

Olson's operators like the LaCrosse "RG", too. With its exceptionally low loading height and firm, smooth platform, they can *drive big equipment on or off more safely* — without fear of tipping over. It's also much faster. "We run our equipment onto the 'RG' with *just one pass* — instead of two or three, like we used to," says Stevenson. "The folding side-extension brackets are especially valuable in hauling wide machines. They're completely out of the way when not in use — yet immediately available when needed."

You, too, can speed work, cut costs, with a LaCrosse Removable Gooseneck Trailer. Available in 25 to 75-ton capacities, with flat, drop-side or beam deck. Mail coupon for complete facts today.

No cables! No winch! No hydraulics!

Trailer bed is raised and lowered by means of ramp on rear of tractor. Gooseneck slides down as tractor drives forward, raises as tractor backs up.

Loading and unloading heavy equipment, like this big crane is a fast, easy operation with the LaCrosse Removable Gooseneck Trailer. Time-tested fifth-wheel kingpin connection between gooseneck and trailer simplifies alignment . . . eliminates need for complicated sheave and cable arrangements . . . and assures *complete control of gooseneck at all times*, whether hooked or unhooked from trailer.

Clip . . . Mail for more facts

LaCrosse Trailer Corp., Dept. D114, LaCrosse, Wis.

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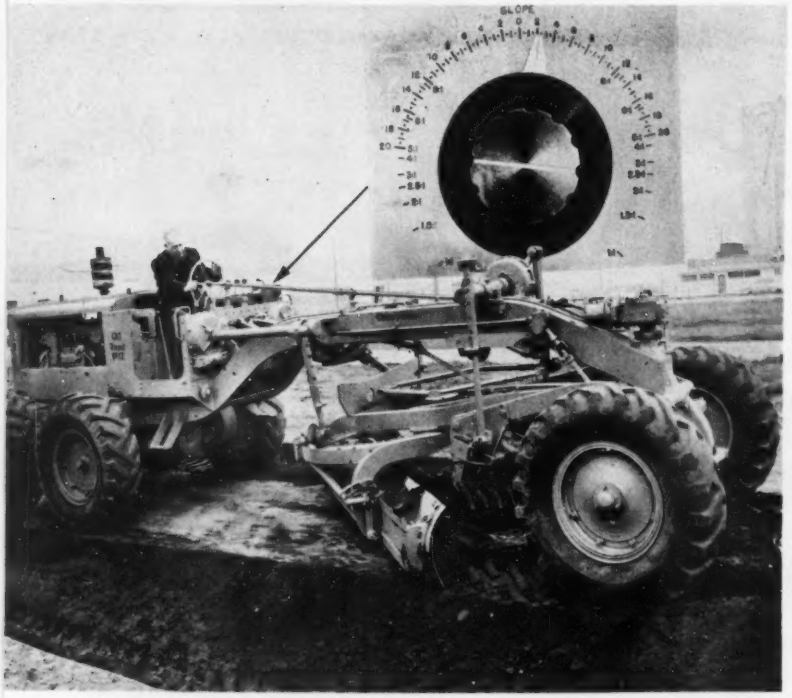


SPEEDS FINISH WORK—Preco's blade control, shown mounted on Caterpillar No. 12 grader, automatically maintains pre-set slope regardless of varying ground conditions.

". . . significant advances have been made in recent years in compacting equipment . . ."

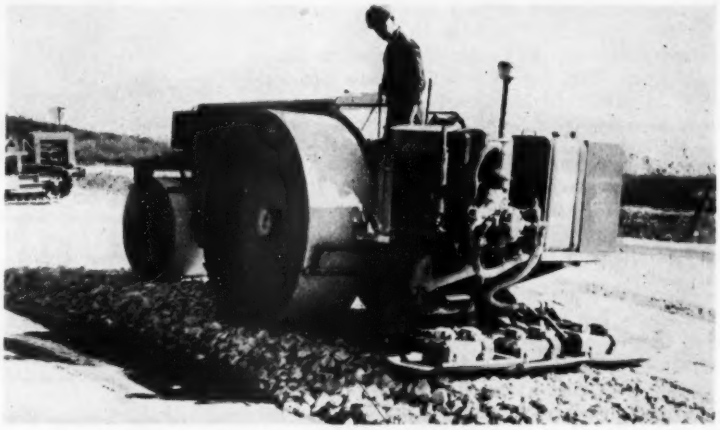
PACKS A PUNCH—ABG's vibratory roller weighs four tons, exerts 20-ton force.

Last year, however, a German self-propelled roller was introduced in this country. It shows promise as a construction unit, especially if the driving roll can be widened to 48 or 54 in. from its present 33½-in. width. The unit is easy to transport because it weighs only four tons, but under vibration it has the compacting ability of a 20-ton roller.

The vibrating unit in the driving wheel of this roller can be adjusted for various soil conditions by a split pulley arrangement. No vibration is transferred to the frame or operator's quarters.

Demonstrations to date show it performs better than conventional rolling equipment on granular subgrade and base compaction, as well as on bituminous concrete binder courses. The manufacturer claims the roller also does a good job of keying in cover stone on seal courses.

Another smaller self-propelled roller has been marketed by an American manufacturer, but it is adaptable only for maintenance and light construction. The weight of the unit can be varied from 2,300 to 3,500 lb, and it is said to give the compaction equivalent of an eight-ton roller.



DUAL PURPOSE—Austin-Western's machine serves as a deep penetration vibratory compactor and surface roller. Rear-mounted vibratory pads are hydraulically controlled.

Also available for maintenance purposes are a number of single-pad vibratory compactors which do an excellent job of compacting bituminous patches and ditch backfills.

There have been outstanding improvements in pneumatic rolling equipment in the last few years, particularly in self-propelled machines with high pressure tires that can compact both pavement foundations and bituminous surface courses.

Several years ago an equipment manufacturer introduced a dual purpose roller equipped with both steel wheel and pneumatic rolling units. It is pulled by a two-wheel tractor, and it offers a wide range of contact pressures through ballast adjustment. Last year the versatility of this machine was further increased by adding a trailing vibratory steel wheel roller. Pneumatic and sheepsfoot rolls that are interchangeable

continued on page 120

WHILE A BUILDING GOES UP...

costs come down

Brainard 4S Engineered Shoring System

Brainard's 4S Engineered Shoring System was designed to fill a need in the construction industry for a quick, simple and inexpensive method of shoring up concrete slabs in all kinds of industrial and commercial structures. Brainard's Engineered Shoring System is composed of a minimum number of parts. Its combined strength and versatility can save substantial construction money for you. Look at these 4S advantages:

SAFE . . . Designed to meet all load requirements for concrete reinforced construction.

STURDY . . . Made of quality welded tubing—parts can be used and reused for greater construction profits.

SIMPLIFIED . . . Engineered into unit tower construction so that the most complex shoring jobs can be handled from any combination of towers.

SPEEDY . . . Designed with slip-fit construction—no bolts, screws nor other fasteners required. One man can erect shoring tower in a matter of minutes—a great time saving feature.

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Brainard Specialty Products

The Brainard Steel Division of **SHARON STEEL**

SHARON STEEL CORPORATION

GRISWOLD STREET, WARREN, OHIO

ONLY DELCO-REMY COVERS

NEW TOTALLY ENCLOSED GENERATORS FOR OFF-THE-ROAD APPLICATIONS

Forced-air cooled for 50% *more* output with *no* increase in size! Splash-proof. Dust-proof. 6-, 12-, 24-volt d.c. models.

NEW PIGGY-BACK GENERATORS

Extra power with economy! Tailored extra output in single voltage systems. You can use *both* 6- and 12-volt d.c. units on the same vehicle.

FULL LINE OF EXTRA-OUTPUT D.C. GENERATORS FOR MEDIUM- TO HEAVY-DUTY APPLICATIONS

CHECK THESE EXTRA-DUTY D.C. FEATURES

- Substantial output at engine idle where required
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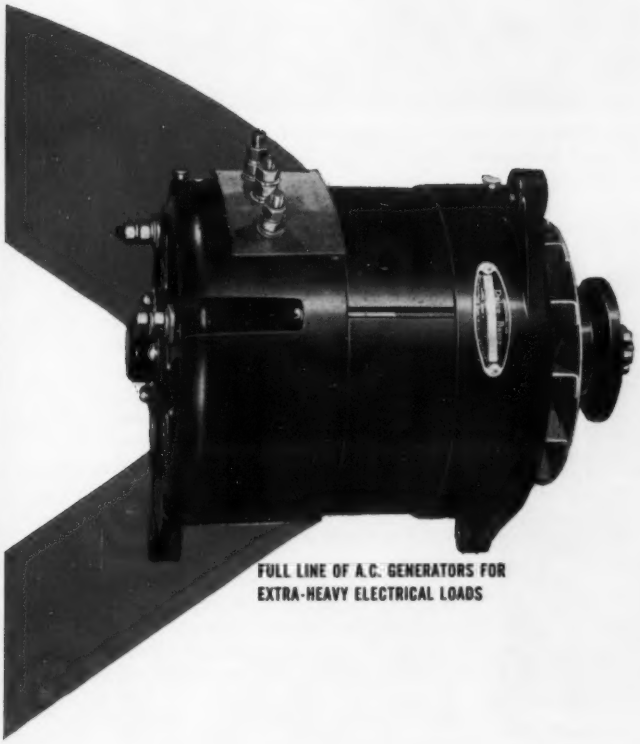
- Ball bearings at *both* drive and commutator ends
- *Sealed* field coils— impervious to moisture and corrosion
- *Double* insulated armature coils— nylon and cotton
- Hot-impregnated armature for extra insulation
- Dynamically balanced armature
- Wider, heavier brushes— service up to 100,000 miles is common

ALL THE BASES!

The only complete line of both d.c. and a.c. generators— right for your job!



FULL LINE OF A.C. GENERATORS FOR EXTRA-HEAVY ELECTRICAL LOADS

Name your generator need. Better charge at engine idle? More power for the ever-increasing demands of more and more electrical accessories? Lower replacement cost for lighter duty operation?

You name it. Delco-Remy meets it. Delco-Remy, in fact, has the *only* complete line of both d.c. and a.c. generators with matching waterproof regulators to meet every fleet requirement. Whether you haul light loads or heavy loads—off the road, around town, or across the nation—at highway speeds or in creeping traffic—Delco-Remy has the *right* generator to fit your need.

The complete Delco-Remy line brings you this important benefit: When you buy these extra-duty generators through the United Motors System, or from your vehicle dealer, you get the tailored performance you need—at minimum cost.

Specify Delco-Remy extra-duty generators on your new equipment, and for replacement on your present equipment. Only the complete Delco-Remy d.c. and a.c. line covers all the bases to fit every generator need.

CHECK THESE SUPERIOR A.C. FEATURES

- Greater output at engine idle
- Dependable performance at all operating speeds
- *Exclusive* self-regulating current control— *no current regulator or limiter needed*
- *Exclusive* stainless steel slip rings
- Extra-large ball bearings at *both* drive and commutator ends
- Shaft-keyed rotors prevent high torque slippage
- Easy all-around maintenance— positive oiler lubrication

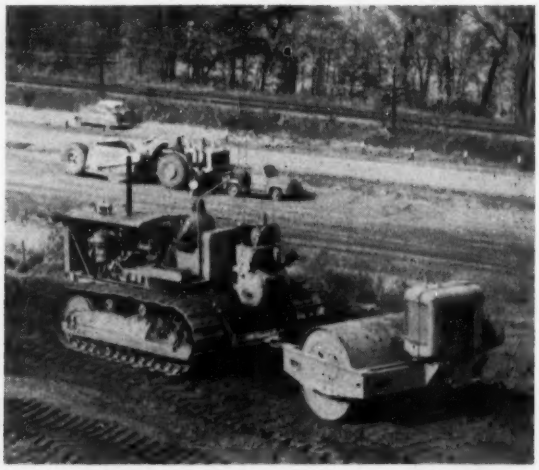
GENERAL MOTORS LEADS THE WAY—STARTING WITH

Delco-Remy

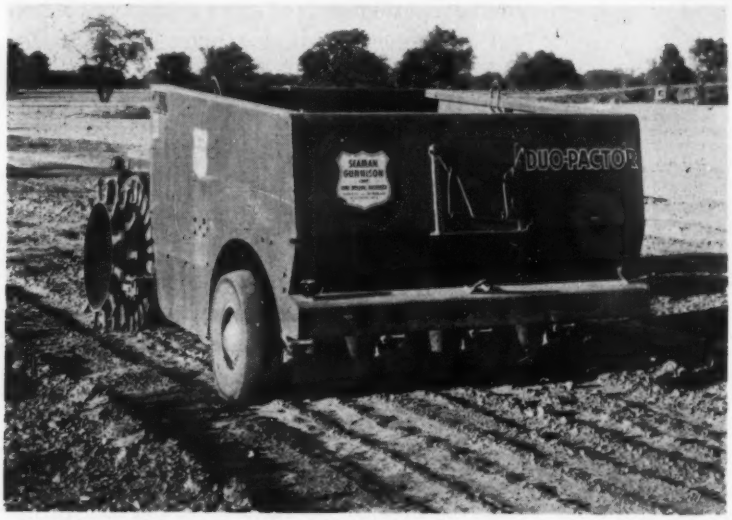
ELECTRICAL SYSTEMS

DELCO-REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA

VERSATILE—Six electrically controlled vibratory compactors on this Jackson unit can be detached or regrouped to suit job conditions.



TOW TYPE—Bros Vibra-Pactor weighs slightly more than four tons but exerts force equal to that of a 7½-10-ton static-weight roller.



MULTI-PURPOSE—Seaman Gunnison's Duo-Pactor combines steel roll, pneumatic, and sheepsfoot rolling in one machine. A vibratory unit is also available as an attachment.

with the steel roll under the ballast box are also available. These innovations enable the roller to handle a wide range of compaction jobs.

The two-axle pneumatic roller is designed with the front and rear tires staggered one-half the tire width. There is merit to this midway tracking on two-axle rollers because a slight offset that covers only the space between tires often results in a followup of the pressure grooves produced by the tire sidewalls.

The stabilizing plant is another new device designed to keep abreast of the trend towards greater use of stabilized bases. The plant is essentially an elevated pugmill with receiving and discharge hoppers and provisions for adding water or bituminous materials.

Stabilization of deficient local materials with calcium chloride, cement, or bitumen by controlled mixing is another method of conserving our decreasing supply of good roadbuilding materials.

Automatic Batch Plants

There have been a number of new and valuable improvements in equipment used for mixing and processing bituminous materials. One of the outstanding developments is automatic controls that eliminate human error in the batch plant field.

With electric and hydraulic controls and timing devices, one man can watch a plant go through the various cycles of automatic batching, dry mixing, weighing, introducing asphalt, wet mixing, and discharge. Should any size of aggregate in the storage bin be inadequate for the requirements of a batch, the mixing operation automatically stops until the required amount of aggregate of each size is discharged to the weigh hoppers, at which time the mixing cycle automatically continues.

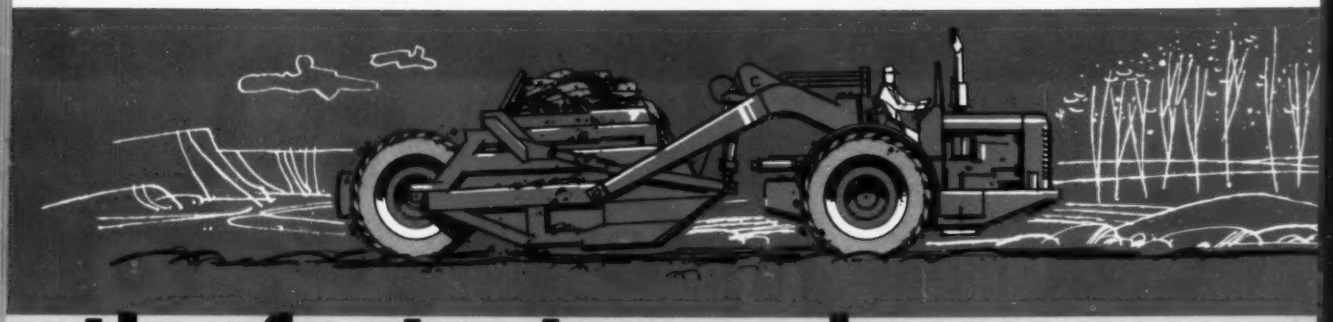
With automatic controls it is possible to proportion accurately and simultaneously all sizes of aggregate and also to have some cycles overlap (such as weighing a second batch while the first batch is being mixed and discharged from the pugmill). Automatic timing assures the proper sequence and prevents one operation from starting until the previous operation has been completed. Naturally, such automatic operations eliminate operator fatigue and reduce the possibility of human error.

The automatic features show their greatest economies when a number of repetitive batches of the same gradation are processed. If several batches of a different gradation are required, a single hydraulic control will disengage the automatic controls and permit manual operation of the various cycles. On completion of the batches of off-standard mix, the plant returns to fully automatic operation.

continued on page 125

Look ahead....*move ahead*...and stay ahead

with ALLIS-CHALMERS



the fastest-growing name in motor scrapers

In 1957, earth movers the world over bought more Allis-Chalmers motor scrapers than ever before! This growing popularity is the best proof of the productivity and reliability of this outstanding line. There are good reasons for this trend toward Allis-Chalmers construction machinery . . . investigate these advantages before you buy.

Three models to help you match your job needs.....

TS-360

Fastest-loading big machine in the business... 280 hp moves 20 yd loads at high speed.

the only line with all these basic

TS-260

A new measure of performance in this size range . . . 200 hp . . . 14 yd . . . full 90-degree turning.

TS-160

True versatility and economy in a utility machine . . . 155 hp . . . 9½ yd . . . turns non-stop in less than 25 ft.

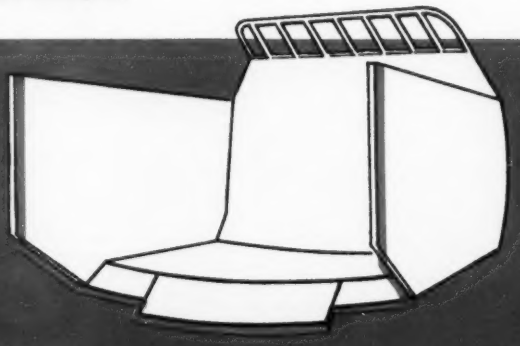
advantages in every size . . .

- high power-to-yardage ratio
- low, wide bowl
- positive forced ejection
- high apron lift

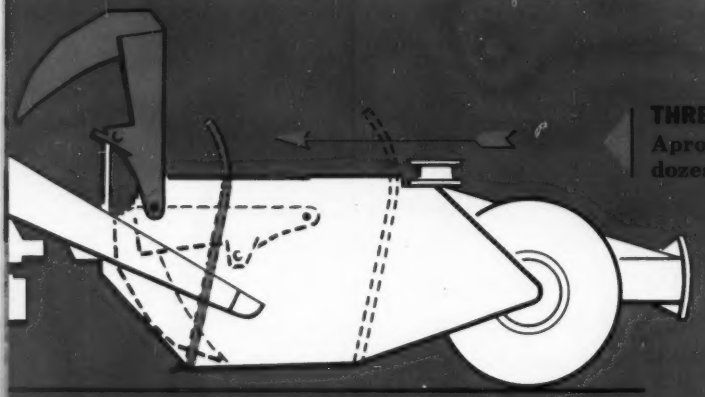
on the big jobs . . . or for utility work

See these big advantages of Allis-Chalmers motor scrapers

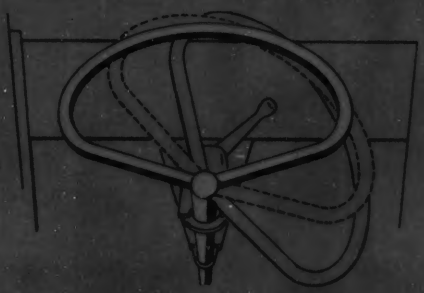
...IN A WORKING DEMONSTRATION



LOW, WIDE BOWL... Loads full—fast—with low resistance, live action.



THREE-POINT APRON-EJECTOR LINKAGE—Apron opens high as the positive ejector dozes out the load . . . clean and quick.



SELECTIVE HYDRAULIC STEERING—Accurate, sure control at any speed . . . fast, full-swing steering with a 30-degree turn of steering wheel right or left.

A DEMONSTRATION WILL PROVE IT—

Your Allis-Chalmers dealer will be glad to arrange a demonstration to show you these machines in action. When you've seen and tried these high-performance motor scrapers, you'll know why more dirt movers every day . . .

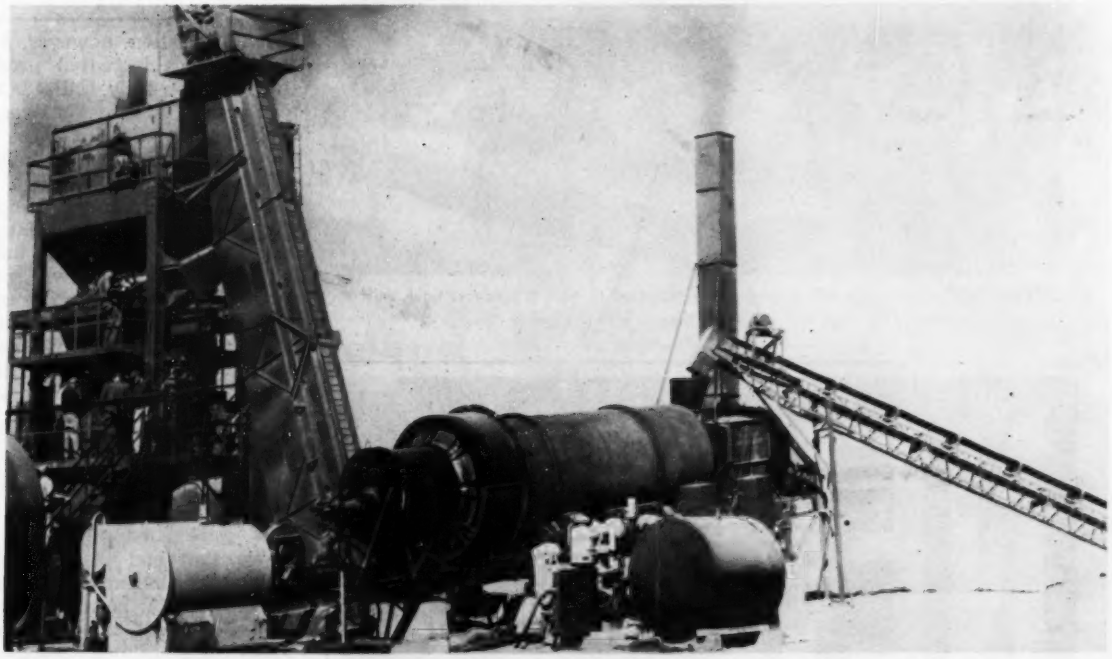
Look ahead...*move ahead*...and stay ahead

ALLIS-CHALMERS CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

FORM MS 1298-584

Litho in U. S. A.



FAST AND ACCURATE—Typical of electrically powered, automatic bituminous plants now available is Pioneer's Auto-batch plant, which is rated at 6,000 to 7,500 lb per batch. Bitumin system is jacketed for hot oil heating. One man controls the mixing cycle.

While automatic operation is the principal feature of the new mixing plants, there are other improvements to components that become apparent as we trace the flow of materials from the stockpile to the finished bituminous concrete.

First of all, we now have multiple bin control at the cold aggregate feeder. The rough proportional control of two sizes of stone and two sizes of fines when fed to the dryer is a boon to production because it practically eliminates the possibility of a bin running low in the tower that feeds the pugmill.

As the cold stone is fed to the dryer, it is subjected to a clean, long-flame heat blast generated by a low-pressure air atomization system for the fuel oil. These dryers, with capacities up to 200 tph, have been in use for about three years and are much more economical than auxiliary steam methods that were used in the past. When the aggregates and bitumen reach the mixing stage in these plants they are introduced into pugmills of shorter length and greater diameter than the conventional types, and a better mixing action results.

Nearly all batch-type plants such as those just described and many of the continuous-type plants are now powered by electricity. This not only makes single switchboard control possible, but it also eliminates the need for two or more gas or diesel power units.

In the volumetric control and continuous mixing field there appears to be a trend toward plants that will produce larger hourly tonnages. This type of plant, due to its design, is practically automatic in its operation. Controls that automatically stop the proportioning and mixing function because of an insufficient supply of one size of aggregate are readily available on this type plant as well as on the batch-type plant.

During the last five years there has been a notable trend in the heating of asphaltic materials: hot oil and electrical methods have largely replaced the old steam heating system. The electrical heating method is confined to stationary batch-type plants that are more likely to be located where surplus power is available during off-peak hours.

New Pavers

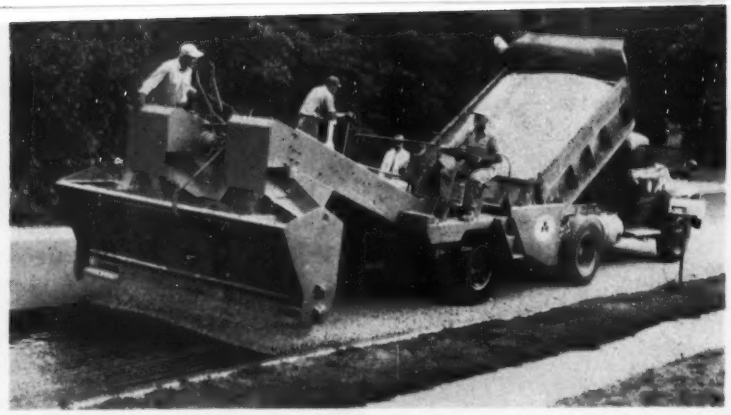
There have been a number of improvements in bituminous paver-finishers during the last several years, and several new models have been introduced.

A new crawler-mounted paver is equipped with an electric vibrating screed that operates at 3,600 vpm. This feature permits higher operating speeds because of the reduced tendency to create voids or to pull the mat. The transmission gives 15 paving speeds varying from 11 to 102 fpm and a maximum travel speed of 2.2 mph. This unit is reported to have operated at speeds up to 58 fpm on binder courses.

Several years ago a pneumatic-tired paver was placed on the market, and the original model has undergone several improvements since that time. Some of the advantages claimed over the crawler type are lower maintenance and repair costs due to the elimination of hundreds of moving parts, the availability of a longer wheel base, and higher travel speeds.

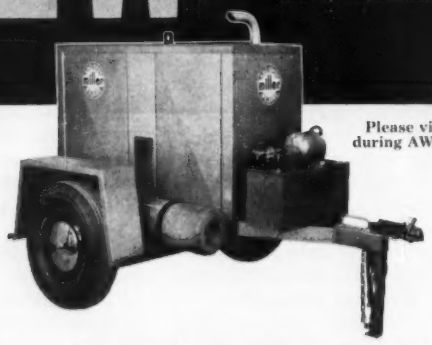
The original model is capable of paving widths from 8 to 13 ft at speeds up to 60 fpm. A newer model employs automation, including automatic load equalizing, and it has a top laydown speed of 120 fpm. Last year a smaller model employing the same features as the larger pneumatic-mounted pavers was introduced.

Greater attention is being given to increased paving speeds by the equipment manufacturer. There



SPEEDY SEAL—Flaherty's chip spreader operates at up 15 mph. It produces tight, uniform surface by placing large chips first and then filling in with fine stone.

NEW DESIGN POWER PERFORMANCE



Please visit booth #507 during AWS welding show

BIG...TOUGH...RELIABLE

. . . and offered in three models for every "beyond the power line" job:

The ROUSTABOUT D-250 DC for metallic arc welding
The BIG RIG DA-300 AC/DC for metallic arc welding
The FIREBALL DAH-350 AC/DC for metallic arc and tungsten inert gas welding

All models have a 10 kw single phase 115/230 volt ac power plant and deliver, while welding, 1 kw of 115 volt dc auxiliary power. Proven Miller ac generator is driven by Hercules engine. Coupled with the revolutionary new Miller semimetallic rectifier, this produces the industry's finest performing dc welding current . . . bar none!

Complete particulars will be sent promptly. Please indicate model in which you're interested.

miller ELECTRIC MANUFACTURING COMPANY, INC.
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BITUMINOUS PAVING...
continued

is some question, however, as to whether this increased productivity can be fully utilized. Sixteen states have construction specifications that limit the operating speeds of bituminous pavers.

The average rate of placing bituminous concrete pavements has been 34 fpm. Now paver manufacturers claim laydown speeds of from 60 to 120 fpm. The counter claim is that sufficient initial compaction cannot be obtained at these high laydown rates. In rebuttal, it is said that new pneumatic rollers can furnish both breakdown and semifinal rolling at lower costs than conventional methods and with closer control of density.

If paver manufacturers can prove that end result requirements for bituminous concrete pavements can be met at higher laydown speeds, the states should study the related work flow processes—including mixing and hauling—to discover how paver output can be matched.

In the way of future improvements in paver design, it has been suggested that an automatic screed positioning device similar to that described for motor graders might be adapted to bituminous pavers. This would assure close control over crown slope and profile despite irregularities in the foundation courses.

Paving contractors and highway departments who use quantities of low-type bituminous pavements to reseal roads will be interested in a recently developed, high-capacity, self-propelled chip spreader. The machine operates at speeds of up to 15 mph, and it has achieved a daily output of 7 mi of two-lane pavement. The spreader is designed to produce a tight, more uniform surface by placing the larger chips first and filling the voids with the finer stones. When rolled, there is an improved imbedment over that obtained with unsegregated stone chips.

The development of curbing machines has greatly increased the use of asphalt as a curbing material for parking areas, islands, and other highway adjuncts. An asphalt lip curb was used successfully for outside shoulder limits for the full length of the Connecticut Turnpike.

continued on page 130

(Advertisement)

'Our third Cleveland -based on 15 years of dependable performance'

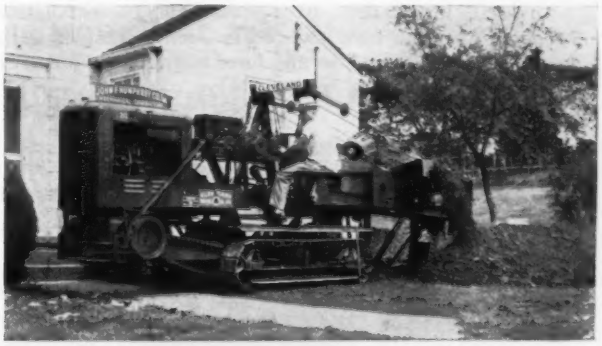
Still in good working order, the Cleveland trencher traded-in by John F. Humphrey Co. of Knoxville, Tenn. on the purchase of a new Cleveland 95 several months ago had been in steady use since 1942. "The purchase of our newest Cleveland—our third—was based on the 15 years of dependable, profitable performance delivered by our first Cleveland," says C. E. Hankins, Jr., vice president of the firm.

Shown cutting an 80-foot service line for 4-inch pipe is Humphrey's newest "95."

The firm is able to schedule more such jobs daily because the Cleveland's fast, safe truck-portability and its wide range of more than 30 usable digging speeds make it fast *to* the job and fast *on* the job.

Long-lived dependability like this is a Cleveland characteristic—one that makes your original investment pay dividends over a long, busy working life. Get complete information from *your* distributor now.

"There's nothing like a Cleveland for trenching."



Good Everywhere

The CLEVELAND TRENCHER Co.

20100 St. Clair Avenue • Cleveland 17, Ohio

(Advertisement)

3 top contractors tell how **Transite Sewer Pipe** helped keep installation costs low on the Allegheny County Sanitary Authority sewage project (Allegheny County, Pa.)

"Transite saved us considerable labor especially when we were working in 18- to 28-foot trenches . . ."

says W. R. Davies, W. R. Davies Company
Pittsburgh, Pennsylvania

"For the Allegheny County Sanitary Authority we used Transite Pipe for Sanitary Sewers because it is faster to install, lighter, and more readily handled than the other materials specified as alternates. Transite saved us considerable labor especially when we were working in 18- to 28-foot trenches.

"Another part of our 'Authority' contract included the installation of 5,300 feet of Domestic Water and Fire lines at the 150 MGD capacity Pittsburgh Sewage Treatment Plant. We used Transite Pressure Pipe for this entire job. Our costs were low because it is faster to install."

W. R. Davies Co. installation.

"In a remarkably short time, our men installed two miles of Transite . . . even though they worked below the adjacent river level . . . and between railroad tracks and one of the most congested highways in the county . . ."

says P. A. Benintend, Ben Construction Company
Pittsburgh, Pennsylvania

"For the Allegheny County Sanitary Authority Contract, Transite's ease of installation . . . sure coupling . . . and 13-foot lengths saved money for us in over-all installation. In a remarkably short time, our men installed two miles of Transite Sewer Pipe and force mains, even though they worked below the adjacent river level to install the force main—and between railroad tracks and one of the most congested highways in the county to install the sewer. Speed of installation plus prompt delivery enabled us to finish the job well before the required completion date."

"We installed Transite Sewer Pipe in some of the toughest locations on this job."

says D. C. Rothey, Project Manager
Harrison Construction Company
Pittsburgh, Pennsylvania

"In our stretch down along the Allegheny River we were constantly 5 to 14 feet below normal pool stage level. Final inspection revealed no infiltration."

Transite Sewer Pipe installations on the $100-million Allegheny County Sanitary Authority Project. Shown here is part of Harrison Construction Co. contract.

Ben Construction Co. installation.

How TRANSITE PIPE answers your two most important problems in sewer installation and operation!

In installation, your big problem is time. For the longer it takes to complete a "tight" installation the more it costs . . . the more annoying the problem of torn-up, detoured streets. And this is where Transite® pays its way in time-saving alone. Its lightweight, long lengths and quickly, *surely* assembled Ring-Tite® Coupling speed every step of installation.

In operation, infiltration and root-clogging can be even more costly. But they're problems that Transite's Ring-Tite® Coupling was designed to solve. Rubber sealing rings, tightly compressed between sleeve and pipe, give you a tight, long-lasting joint that locks out roots . . . seals out unwanted ground water.

Let us send you booklet TR-165A. Address Johns-Manville, CM Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.

JOHNS-MANVILLE

JOHNS-MANVILLE JM PRODUCTS

GROWING POPULAR—Pneumatic rollers are used extensively for breakdown and intermediate rolling. When contact pressure is adequate, pneumatic rollers build density that is not otherwise achieved until traffic rolls on pavement. Steel rollers make final passes.

BITUMINOUS PAVING . . . continued from page 126

Equipment Spurs New Techniques

AS A RESULT of the new equipment developments improved methods have also been developed.

It already has been noted that the electronically controlled motor grader blade will provide better control over fine grading and subsequent operations such as bituminous paving. The advent of vibratory rolling and compacting equipment is bound to lead to more advanced and controlled compaction methods and to increase productivity in densifying operations. Improved bituminous mixing and processing equipment will undoubtedly result in improved designs and construction methods.

In addition to the new methods attributed directly to new equipment, there also have been a number of new techniques that employ both new and conventional equipment.

As an example, there has been an increase in the use of pneumatic rollers for the consolidation of bituminous concrete pavements during the last several years. Such rollers have been used both for breakdown rolling and for intermediate rolling prior to smoothing with a steel-wheel roller.

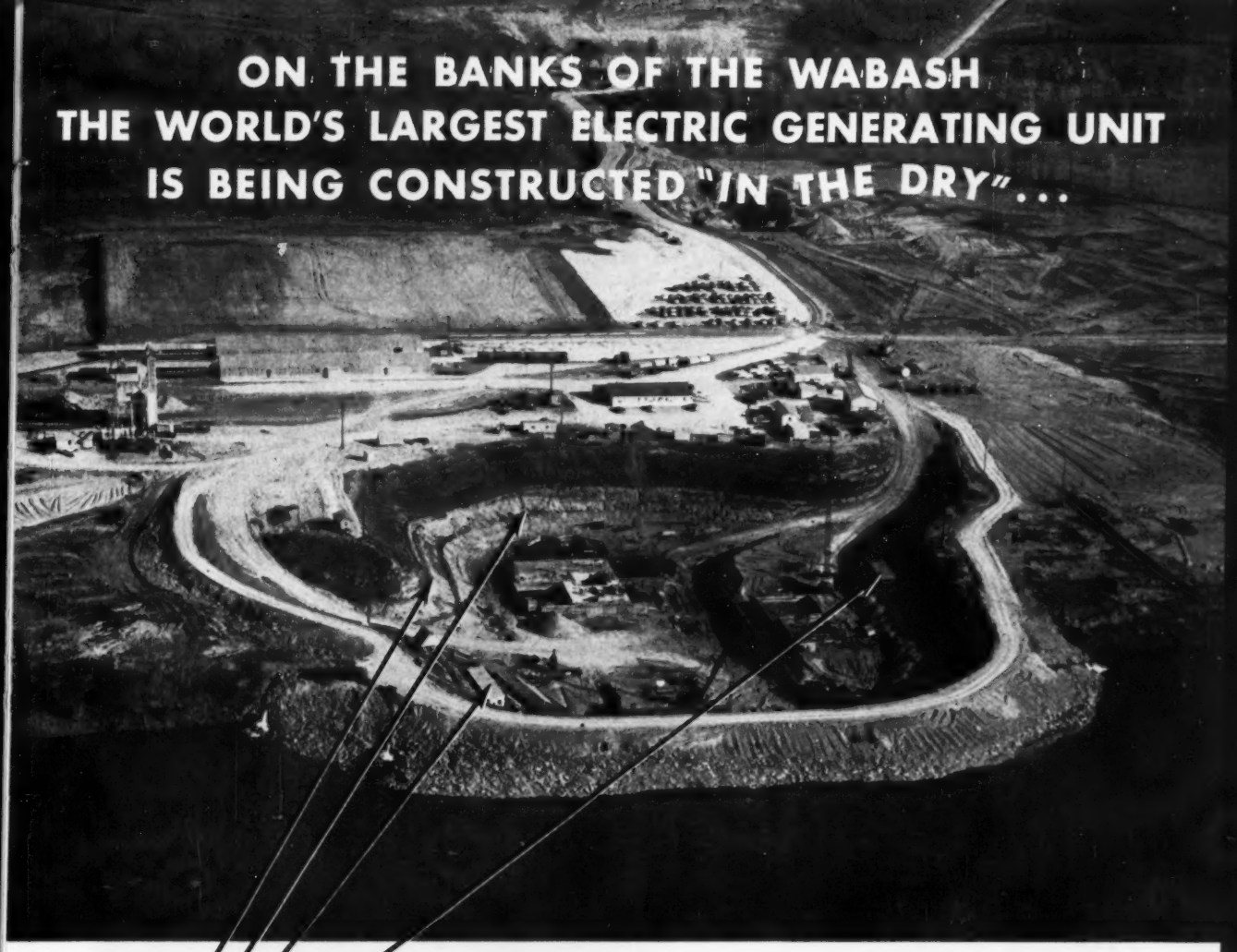
Breakdown rolling is done with tire pressures and ballast loads adjusted to produce an average tire contact pressure of 35 to 40 psi. Due to the contour of the tire under these conditions, horizontal forces are exerted and these help to produce better particle distribution. For breakdown rolling with pneumatic-tired rollers, provisions must be made for cooling the tires and scraping off pickup.

Intermediate or semifinal rolling is normally performed with tire pressures and load adjusted to produce a contact pressure of 80 to 90 psi. The objective here is to build a density into the pavement that previously was not obtained until the pavement had been subjected to heavy traffic. Densification under traffic often results in distortion caused by wheel ruts on the finished pavement section.

The military has already developed a method of changing tire pressures while a vehicle is in motion to provide good traction under various support conditions. A similar arrangement could be made in designing pneumatic rollers so that the same machine could be used both for breakdown and intermediate rolling with a minimum of conversion time.

The Ohio Department of Highways experimented with a heavy-duty pneumatic roller last summer in rolling bituminous concrete binder courses. They obtained an average of 101.65% of density with a pneumatic roller having 13.00-24 tires inflated to 90 psi

ON THE BANKS OF THE WABASH THE WORLD'S LARGEST ELECTRIC GENERATING UNIT IS BEING CONSTRUCTED "IN THE DRY"...



Breed Electric Generating Station near Fairbanks, Indiana
Owner: Indiana & Michigan Electric Company, Fort Wayne, Indiana
Pumping Contractor: American Dewatering Corporation, New York

MORETRENCH WELLPOINT EQUIPMENT, pumping steadily, keeps 38′ of water under careful control at Breed Plant while construction speeds ahead in dry material.

During recent flood stage, a 52′ head of water was held in check by the wellpoint system, necessitating pumping 22,000 GPM. Material is coarse sand and gravel.

When finished, the Breed Plant will be the world's largest single generating unit with a capacity of 450,000 KW.

A large power plant—or a small sewer—it makes no difference. If it's wet, we're interested in helping you plan for efficient, economical construction—IN THE DRY. Call our nearest office for a *realistic* estimate on your requirements.

MORETRENCH CORPORATION

90 West St.	4900 S. Austin Ave.	7701 Interbay Blvd.	315 W. 25th St.	Rockaway
New York 6	Chicago 38, Illinois	Tampa 9, Florida	Houston 8, Texas	New Jersey
CO 7-2283	Portsmouth 7-4212	Tampa 61-1881	Underwood 4-7774	Rockaway 9-2100

Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington
Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario
Brazilian Representative: Oscar Taves & Co., Ltd., Rio de Janeiro

(average tire contact pressure was about 77 psi). Steel-wheel rollers on a similar section obtained a density of only 98.49%.

Several factors have been responsible for the limited use of pneumatic rollers on bituminous concrete constructions to date: we have not had a suitable yardstick for measuring the compactive ability of pneumatic tires; and equipment requirements in construction specifications have been restrictive.

The compacting ability of pneumatic-tired rollers depends on the average contact pressure. Contact pressure in turn is influenced by the tire size, ply rating, load on the tire, and inflation pressure.

Only in the last several years has it been recognized that the average contact pressure exerted by pneumatic tires is not limited to or necessarily equal to tire inflation pressure. Several tire manufacturers and the Corps of Engineers have developed contact pressure data for some sizes of smooth and treaded tires. Such basic engineering data, however, are needed for all sizes of compacting tires.

Our development division is working with both tire and equipment manufacturers to develop criteria that will show the compacting ability of pneumatic-tired rollers. This involves not only "average contact pressure" for the rated wheel loads but also the allowable ranges of wheel loads and inflation pressures.

Many bituminous technicians now prefer the use of pneumatic-tired rollers for keying in stone chip seals on surface treatments. By employing pneumatic tires at the lower contact pressure ranges, it is possible to get good stone imbedment without crushing the particles. A two-axle roller with the rear axle tracking approximately midway between the tires of the front axle is preferable because streaking is eliminated.

Mixed-in-Place Seals

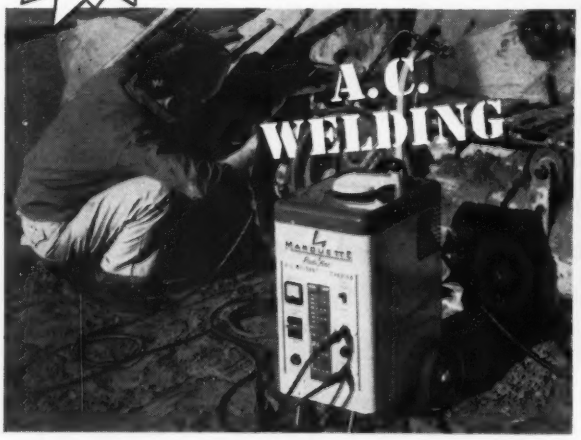
For resealing low and medium-type pavements that carry considerable volumes of traffic, there seems to be a trend away from liquid seals toward mixed-in-place seals.

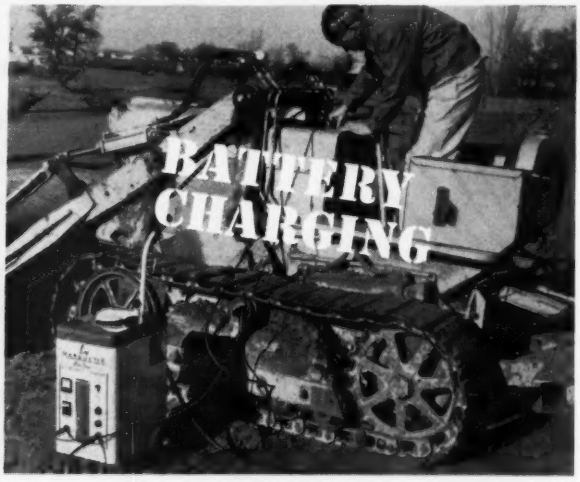
Both Virginia and West Virginia have reconditioned many of their older pavements with an inch or more of mixed-in-place material laid down with a travel plant. Leveling of serious cross-sectional deformities is usually done before a wearing course is applied. Connecticut is using a blade-mixed seal of about 30 lb per sq yd. Both of these methods are aimed at an improved skid resistant riding surface and additional structural stability.

There seems to be an increase in the use of asphalt emulsion to seal both concrete and bituminous pavements on highways and airports. A slurry seal is usually placed before a bituminous lift or surface treatment.

The Rochester, N.Y., Department of Public Works has made several novel applications of emulsion slurries in its street maintenance program because it was dissatisfied with conventional street resurfacing materials. It

NOW You can do both





. . . with One Unit!

The MARQUETTE *Redi-Arc*

Here it is! The Marquette *Redi-Arc* unit, two high quality machines in one . . . an ideal welder for light to medium work and a fast charger for all 6 or 12 volt batteries.

WELDING: Easy-starting arc, easily maintained throughout wide 20 to 180 Ampere range. Takes electrodes of all types 1/16" thru 3/16" . . . handles A.C. metallic arc welding and cutting plus arc torch brazing, soldering and heating jobs.

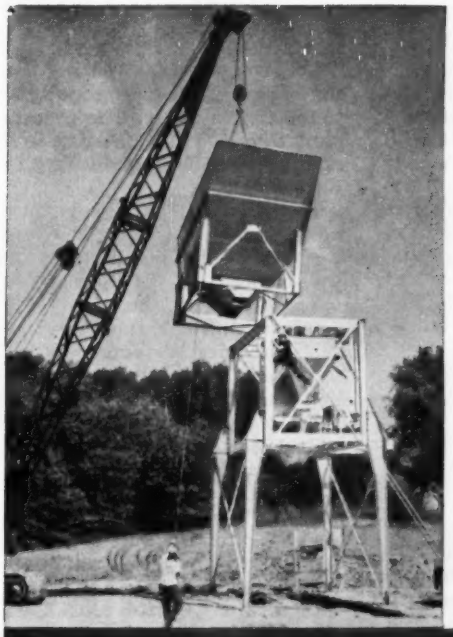
CHARGING: Flip a switch to use as a charger for all 6 and 12 volt batteries. Easily read, color-coded charging rate indicator shows correct current setting. Delivers up to 50 Amperes at 6 volts, 25 Amperes at 12 volts.

Marquette *Redi-Arc* Welder-Chargers give superb performance, service-free operation. See one soon . . . discover how you profit more with this simple, versatile machine.

MARQUETTE

MARQUETTE MANUFACTURING CO., INC.

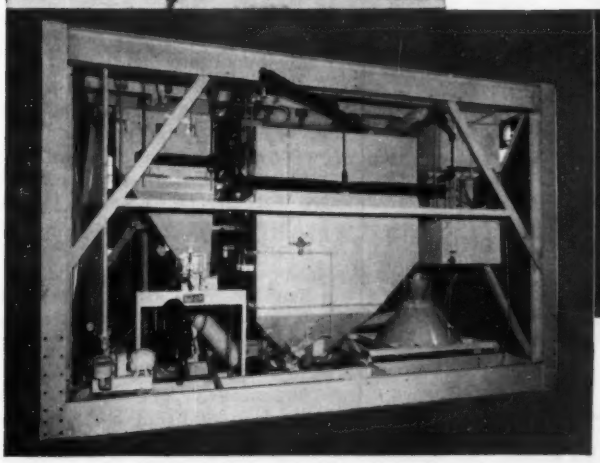
307 E. HENNEPIN AVENUE • MINNEAPOLIS 14, MINNESOTA

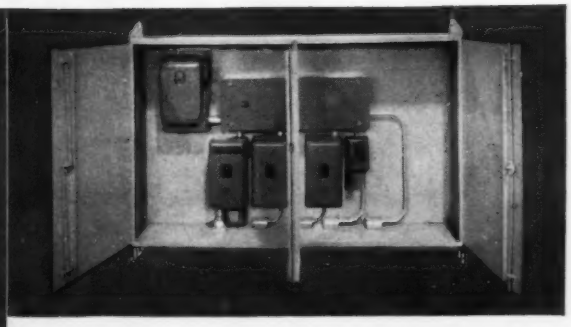


BUTLER Portability

COSTS YOU NOTHING!

Your BUTLER HP-85 Ready Mix Plant Pays Back the Cost of the Portability Features the First Time It's Erected





(Above) The Service Entry Panel provides all electrical connections.

(Left) The self-contained Butler HP-85 Batcher section has piping and wiring all in-place.

In the first place, the HP-85 is erected in hours instead of days. Bring it to your job-site today, you're pouring concrete tomorrow. And pouring is limited only by your crane and truck mixers.

Right there is an enormous saving in costly man and equipment hours.

Transport costs are low. All components are actually their own package. The bin is a unit complete with bracing. So is the batcher section, with air-piping and wiring all in place. Support columns are hinged to the batcher frame, swing into position as it is raised. The cement bin ships in one piece with legs attached and the two-piece elevator comes with buckets and chains installed.

But here's the biggest saving of all:

BUTLER provides a complete electrical Service Entrance Panel. All circuitry is installed, all switches in place — everything ready to plug-in with quick connectors. Field wiring is eliminated, at a saving of thousands of dollars.

That's it. While the HP-85 was engineered primarily to be moved from job to job, many Ready Mix operators are buying it for permanent installation. Why? It *more* than repays the cost of these features in one installation.

Want more details about the HP-85? Send for this Bulletin. Just write "HP-85" on a post card, sign it and send it in.

BUTLER BIN CO.

949 Blackstone Avenue • Waukesha, Wisconsin

has used an asphalt slurry composed of sand (95 to 100% passing a No. 10 sieve), crushed stone screenings (90 to 100% passing a ⅛-in. sieve), and emulsified asphalt (modification of AASHO SS-1) not only to seal old cracked pavements but also to seal new, open-type plant mixes following the final rolling.

The slurry is mixed in a batch plant and placed with a spreader box that has an interior lined with rubber flaps. It is equipped with an adjustable screen.

Before placing the slurry, old streets get a thorough flushing, and cracks are cleaned out with water and compressed air. Streets are then broomed, if necessary, and flushed several hours before the seal is placed in thickness of about ⅛ in. The city found that this method substantially reduced maintenance costs, especially during winter and the spring breakup.

Another new method recently introduced into this country is the impact method of mixing bituminous materials. The process was developed in Switzerland and has been used extensively in Europe.

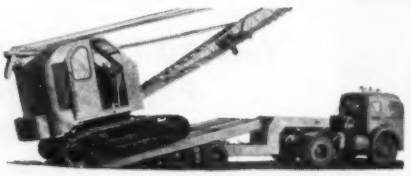
The principal variations from conventional plant mixing are the introduction of bitumen into the pugmill in the form of a vapor under pressures of 250 to 300 psi; and highspeed mixing that provides a tossing rather than a kneading action. With the aggregate tossed up into the concentrated bituminous fog, individual particles are instantaneously and uniformly coated.

A bituminous equipment manufacturer has experimented with several of these impact mixing pugmills in combination with other conventional equipment, and results to date have been very encouraging. In Flushing, N.Y., binder courses, fine bituminous concrete, and sheet asphalt were mixed in such a plant. The coarser mixes were coated in much less mixing time, and the sheet asphalt appeared more friable and uniform. More extensive tests are being conducted in St. Paul, Minn., with many types of standard mixes. The impact technique was also successfully utilized to mix fine aggregates and soils for experimental projects at Mt. Aye and Carroll County, Iowa.

Advantages of the impact method in addition to those already mentioned appear to be the use of less bitumen and a much faster mixing cycle. Here again, this method can not be used effectively until construction specifications are revised.

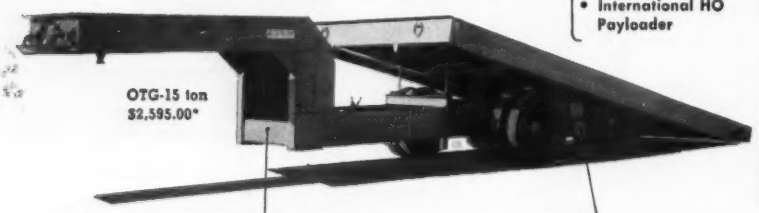
I have discussed many of the new and more significant developments in equipment, methods, and materials. Also mentioned were some of the road blocks—particularly restrictive construction specifications—that hamper progress in developing new methods and equipment.

I can assure you that our Development Division is giving high priority to the problems associated with the promotion and introduction of new equipment, methods, and materials into the bituminous paving field. We hope our efforts will result in a speeding up of all possible improvements in the work processes of providing smoother and more durable pavements.



NEW OTG
MILLER Tilt-Top
15 TON capacity for:

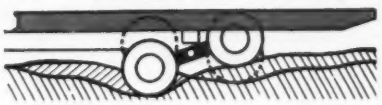
- Insley K½ Hoe/ dragline
- Unit 510-C
- Barber Greene paver
- Caterpillar 977-D
- Allis Chalmers HD 11-G
- Oliver OC-15
- International TD-14
- International HO Payloader



OTG-15 ton
$2,595.00*

with GOOSENECK tongue
and TANDEM AXLE

Heavy box section walking beams oscillate freely on each side—permit each set of tandem dual wheels to rise and fall independently . . . assuring less jarring, less frame strain and a more level ride over rough terrain. Timken roller bearings on walking beam shaft and axles assure positive alignment . . . minimum maintenance.



Here is all the speed, convenience and safety for which MILLER Tilt-Tops have gained wide acceptance . . . engineered into a big 30,000 lb. capacity, gooseneck Tilt-Top. Any one of the heavy equipment pieces listed above, and many others, can be loaded by ONE man in just TWO minutes. The OTG's massive platform measuring 8 x 16 ft. — 20 ft. long if desired, provides all the room you need for big rigs. Built like a bridge underneath, it's topped with 2 inch, traction-sure oak . . . yet is balanced like a watch . . . tilts under a man's weight for loading. And the platform pivots further back than competing tilt trailers . . . permitting lower platform height without a troublesome "beaver tail" ridge. Why bother with slower loading, more awkward trailers any longer — see this production booster at your MILLER distributor today!

*F. O. B. Milwaukee, Wis.
Complete with platform and tires
Brakes and optional equipment extra
*Plus 10% Federal Tax

See your MILLER distributor or write for FREE literature to:

Miller® Tilt-Top Trailer Inc.

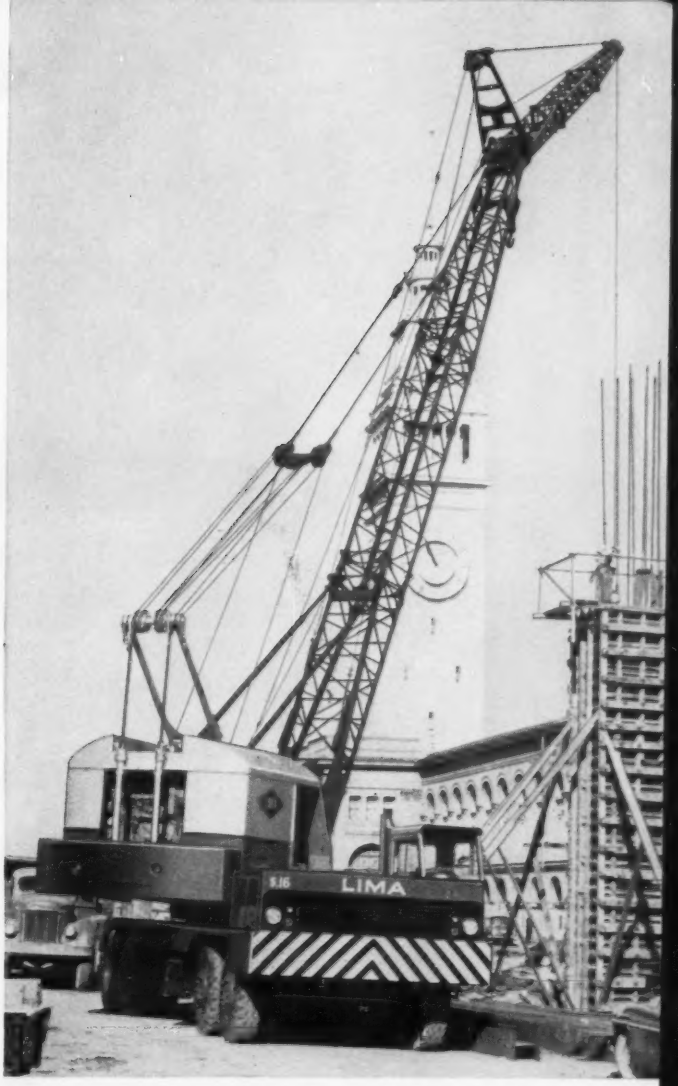
457-D 92nd Street, Milwaukee 14, Wisconsin

LIMA

NEW

LIMA TYPE 84-T TRUCK CRANE

has high capacity, low weight



LIMA's new 4-axle truck crane, Type 84-T, of 70-ton capacity, sets a new standard in the industry. High-strength T-1 steel is used throughout in the truck chassis and components for greater strength with less weight.

The truck chassis consists of two full box section members, joined by seven cross members. Special features include easily removable pin-on-type front and rear outrigger boxes; roller mounted outrigger beams; full length combination deck-fender design; large, full vision operator's cab; frame-width engine compartment; hydraulic steering on all four front wheels. Working weight of the Type 84-T is 121,000 lbs. Minimum stripped weight for highway travel, 85,660 lbs.

The compact rotating unit is designed for heavy-duty service. All motions are air-controlled. Deck gears and reversing bevel gears are enclosed and pump-lubricated. Other LIMA Type 84-T features are: oversize brakes and clutches, liberal use of anti-friction bearings on all main shafts and cable drums, large two-shoe type swing clutches, dual boom hoist drums, power-raised and lowered high telescopic type gantry which reduces travel height to 13′-8″, one-piece rear counterweight easily removed to meet highway limitations and torque converter power take-off.

For further information, see your nearby LIMA distributor; or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

5823

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON

An efficient batch plant and dependable Mack dumpers—two important factors in the modern paving methods used by L. G. DeFelice & Son of North Haven, Connecticut. Ten Mack dumpers supplied the dry mix for the two dual-drum pavers.

On the Connecticut Turnpike...

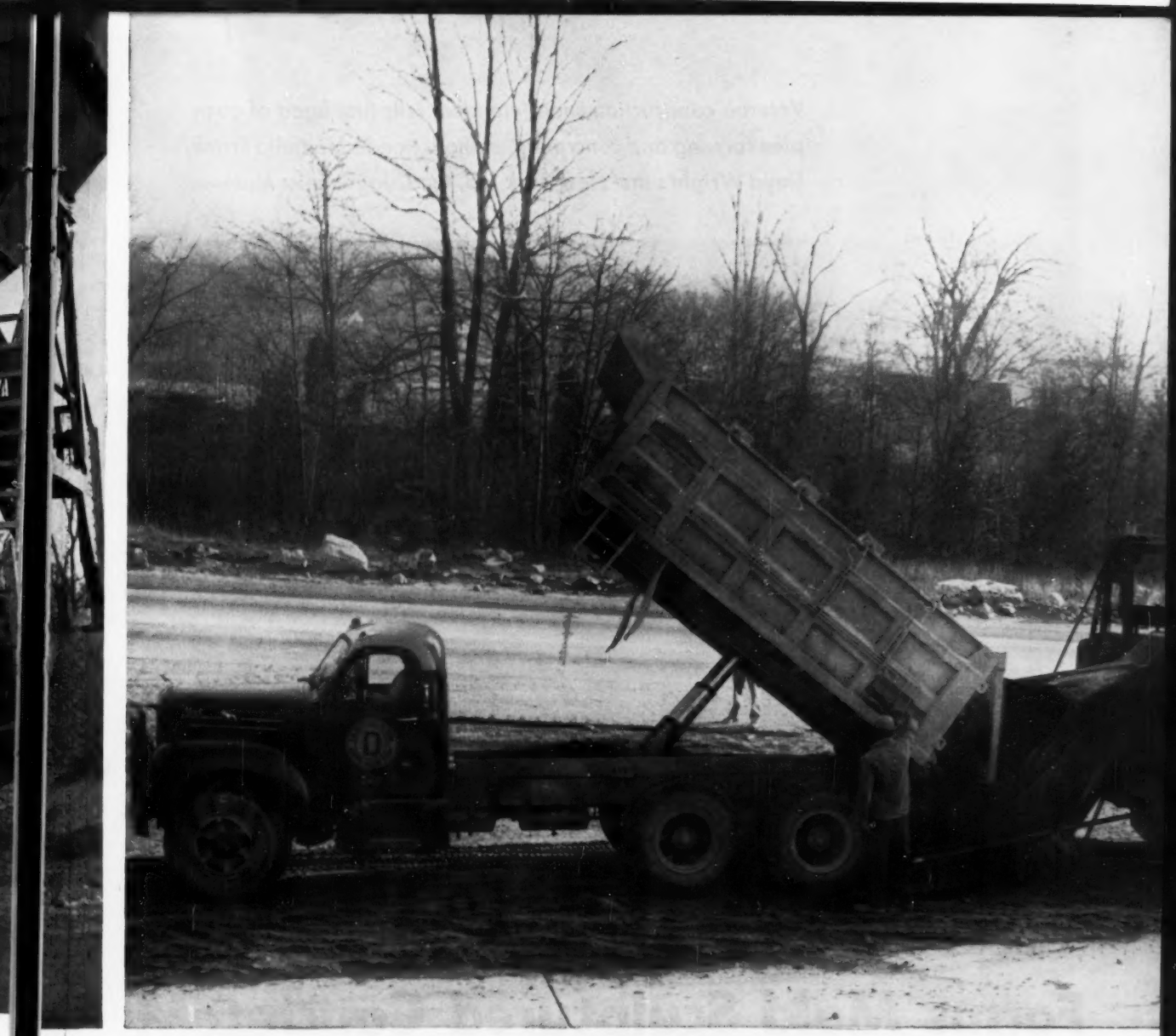
job time slashed by efficient

L. G. DeFelice & Son finished their section of the Connecticut Turnpike well ahead of schedule . . . thanks to efficient batch-haul paving. Their record for a 10-hour day was 1566 cubic yards—enough concrete for 4255 linear feet of 10-inch, 12-foot pavement. Their daily average over the five-mile, six-lane stretch was almost as high. The job was done with ten Mack dumpers supplying two dual-drum pavers working tandem, with wire fabric laid on the five-inch pour of the first paver.

Comments Joe DeLucia, project superintendent for DeFelice, "This job kept the Macks hustling. But they never let us down. We figure that our investment in paving equipment and crews is too big to gamble with trucks that can't keep going. On the vital hauling jobs, we rely on Macks."

The medium-sized Mack dumpers used for this important batch hauling were equipped with Mack

(Advertisement)



Each Mack dumper carried five 1½-yard batches. First batch dumped by opening tail gate. Air-operated batch boards, designed by Equipment Supervisor Felix DiGiusto, speeded dumping of the other four batches. Quickly removable batch boards convert trucks to conventional dumpers with a 10-yard capacity.

batch-haul paving

Quadruplex transmissions, four-wheel drive Mack Balanced Bogies with Power Divider, economical 150-horsepower Magnadyne gasoline engines, and power steering.

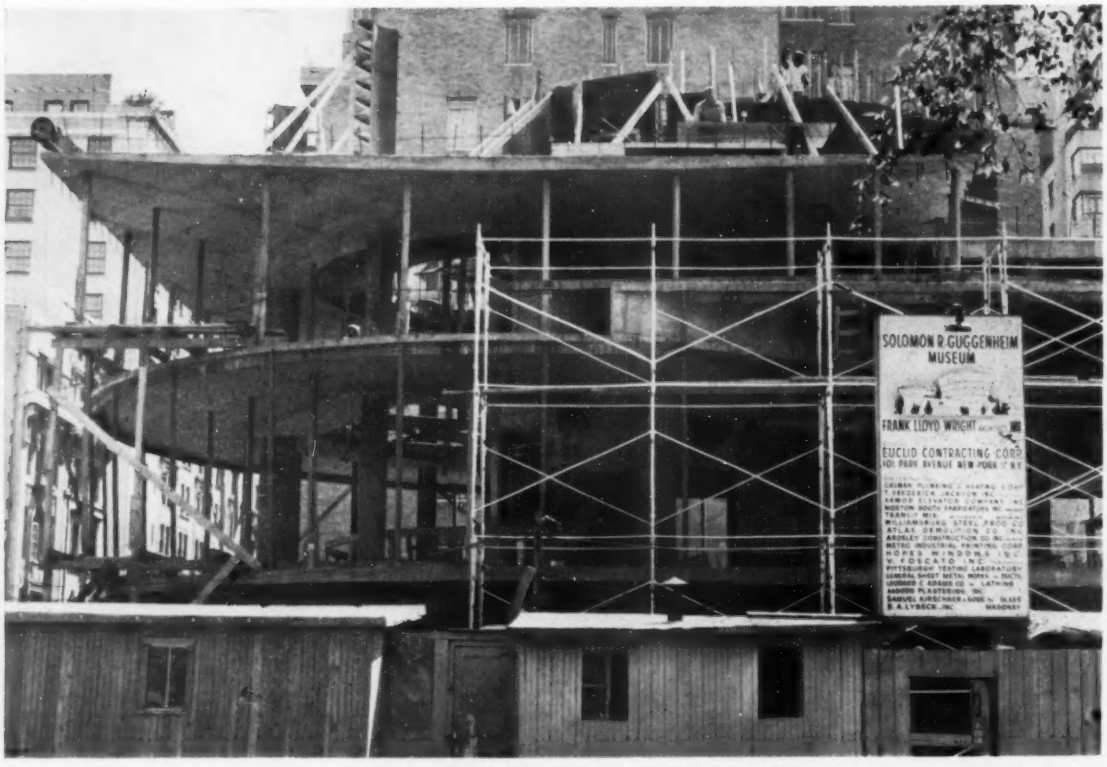
To find out how you can do more work at lower cost with fewer trucks, call in your Mack representative. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK

first name for

TRUCKS

Veteran construction superintendent tells first hand of complex forming and concreting methods needed to build Frank Lloyd Wright's first New York job, the Guggenheim Museum



ADMINISTRATION BUILDING—"This consists of a four-story structure with elliptical concrete columns that support a series of curved cantilevered slabs and concrete parapets."

Forms Mold Sculptured Concrete

By CHARLES W. SPERO,
Project Manager,
Euclid Contracting Corp.,
New York City

PUTTING UP a Frank Lloyd Wright building can only be described as an experience.

My experience came as project manager for Euclid Contracting Corp. during construction of Wright's first building in New York City, the $3-million Solomon R. Guggenheim Museum now nearing completion. It's a building you can't compare in appearance or methods of construction with anything conventional.

Wright has a well-publicized hatred for straight lines. The hatred shows up on the museum job. You'll see this if you think of the building as a two-part structure set on a 128x200-ft site on Fifth Avenue.

One part, the exhibition hall, is an enclosed, continuous spiral concrete ramp that starts at ground level with a 96-ft outside diameter and ends 66 ft high with an outside diameter of 125 ft. A 5-in.-thick Gunited concrete parapet wall encloses the ramp. Wright calls this part of the building "a reverse conical ramp that increases in diameter the higher it goes." To me it resembles a corkscrew

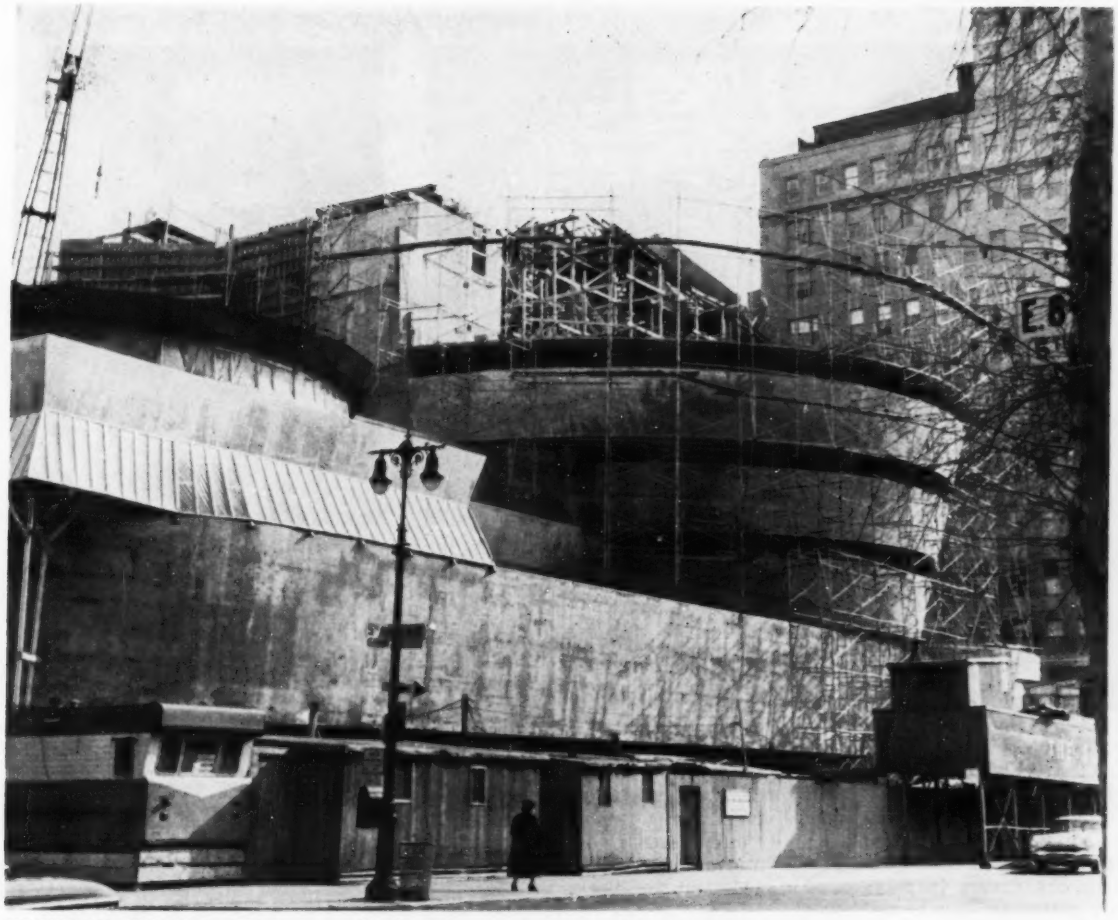
Second part is a four-story concrete administration building. This consists of elliptical concrete columns that support a series of curved cantilevered slabs and parapets of concrete and plaster.

Before starting the job we knew we were in for some unusual doings both in construction and job organization.

First, there was the problem of laying the job out. It's circular design ruled out methods by which more or less rectangular structures are laid out in relation to column points, bench marks, and the like.

Second, carpenters figured to be the most important single trade involved in the job. Complex concrete construction demands complex forms, and our carpenters would have to be highly skilled and fast.

Third, the intricate formwork forced us to study design and fabrication methods that would



EXHIBITION BUILDING—"This is an enclosed, continuous spiral ramp that starts at ground level with a 96-ft outside diameter and ends 66 ft high with a diameter of 125 ft."

Museum

speed erection, stripping, and reuse of forms.

Finally, we had to plan how we could place concrete throughout the building with extreme care.

Lay Job Out on a Grid

The spiral ramp that increases in diameter as it goes upward, oddly shaped and located columns, and the many curves in the building ruled out rectangular layout methods. It was impossible to set up batter boards at corners and draw an outside wall line from which we could take all inside walls, columns, and recess marks.

It was obvious that we'd have to work from a fixed center point.

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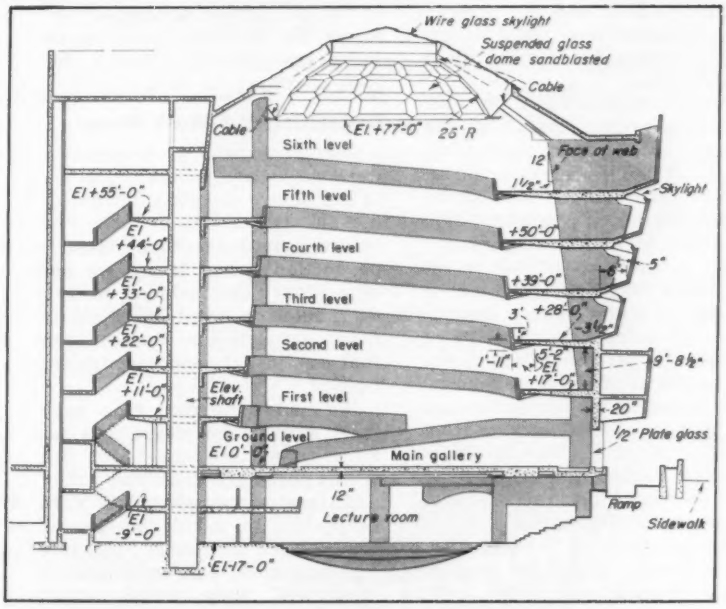
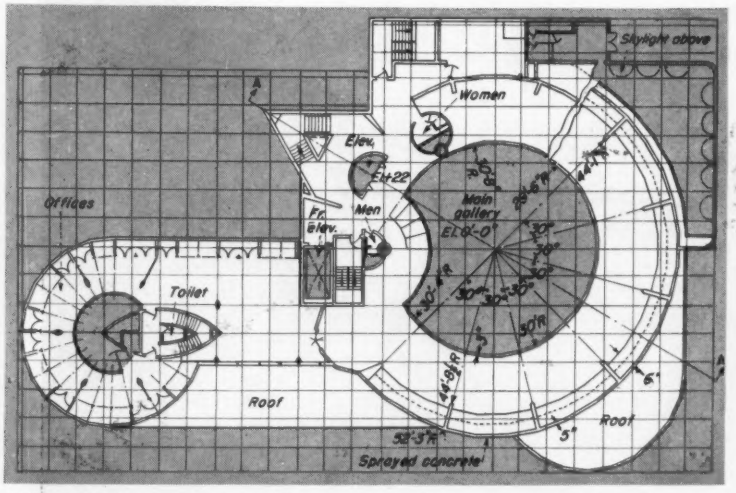
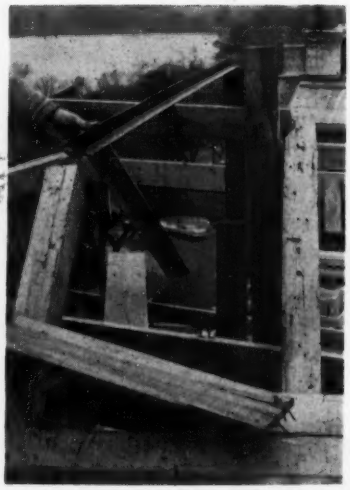


A CROSS SECTION—"Wright calls building's spiral ramp 'a reverse conical ramp that increases in diameter the higher it goes.' To me it resembles a big corkscrew."



GRID LAYOUT—"The entire building on plan is drawn into a rectangular grid pattern supplemented by polar coordinates. We take all building lines from the center point."



CENTER POLE—"We lay out angles and chords from a supported center post.

Wright foresaw this problem by designing the entire building within an 8-ft grid pattern. That is, the building on plan is drawn into a rectangular grid pattern supplemented by polar coordinates in circular areas. Key parts of the structure fall somewhere on the grid lines, grid intersections, or within open areas of an 8-ft grid section. Side views and details are drawn in relation to grid patterns shown on plan views.

That settled the problem of relating sections of one drawing to another. But it did not answer the question of how the drawing could be translated to actual field construction.

Wright suggested putting up a pole to the full height of the building as a center point from which all points for ramps and such could be taken in relation to the grid locations and on 5-deg increment for closest tolerances.

But it would be difficult to set up such a long pole and brace it so that it would remain plumb. Then, allowances would have to be made in all computations for the thickness of the pole from its true center to its circumference. We kept the idea of working from a center point but had to devise another method for establishing this point and bringing it up as construction progressed.

Our answer was to build a 10-ft-sq timber tower of vertical 4x6's cross-braced with 2x9's brought up to a one-floor height. We fixed a vertical post at dead center between the tower legs and secured this post to the legs by additional braces. A nail driven down vertically at the top of the post at true center served as an anchor for tapes and as a center from which we could establish angles and chords for circular construction. Having this center from which to work, we easily ran out lines to establish interior and exterior ramp points, parapets and the like.

And as we completed each floor, we built the tower one story higher and began work on the next floor. The tower at the end of the job served as support for forms for concrete roof beams and as scaffolding for other trades thus offsetting its cost.

Organizing the Work Force

Carpenters who work in building construction generally fall into one of two categories: cabinetmakers (good detail men), or hammer and hatchet men (fast in production). The terms are not derogatory. But seldom do you find both qualities in a single man. Yet, on the museum job that was just the kind of man we needed.

We had some men who have been with us for years, and we knew what they could do. But it was necessary to employ many additional carpenters. New York carpenters as a rule are accustomed to reinforced concrete building work. But we wondered how well they would adjust themselves to this job.

One thing was certain, we couldn't afford to lose time experimenting with them. We had to set up a system by which we could measure a man's ability in rapid order and place him most efficiently with the work force.

We decided to establish two basic carpentry crews after foundation work—relatively simple to do—was completed. One crew would lead off on form fabrication. This would remain a special forms crew throughout the job and would consist of detail men or "cabinetmakers." The second crew would be a production crew. New men coming on the job would join one or the other depending on their capabilities for one or the other type of work.

As work grew heavier and it became necessary to increase the work force, we formed a third crew to do production work on parapet walls, slabs, and the entire administration building.

In general, one laborer worked with every two carpenters. Reinforcing steel erection we sublet to Bar Steel Co. of New York, a reinforcing subcontractor.

Foundation Construction

Building the foundation was easy. We shoveled and clamshelled down to about 20 ft below sidewalk grade to a strata of soft rock that would support spread concrete footings. Only problem encountered in this work was the removal of some old foundations that required jackhammering.

Rough lumber and timber braces formed footings that varied in sizes from 4x4 ft to 10x20 ft, and in thicknesses from 16 in.

From MINNESOTA to the "BIG MO"...

Manitowoc dragline digs 400,000 yards per month. Easily dismantled for major moves.

Using a Manitowoc Model 4500 dragline equipped with a 7-yd. bucket and a 100′ boom, the Luhr Construction Company of Columbia, Ill., averaged 400,000 yards of black dirt per month on a river cleanout and widening project near Beltrami, Minn. Right after this job the big Manitowoc was dismantled in only four days, shipped to Sibley, Mo., and then reassembled in less than three days. At Sibley the 4500 drag worked on a 180′ — 220′ wide, 23′ deep channel diverting a section of the Missouri River.

The big capacity Manitowoc 4500 is easy to ship and easy to assemble, making long distance moves like this both practical and profitable. By using both the mast and boom during tear-down and reassembly, the 4500 is practically a self-dismantling unit.

Despite its size, this Manitowoc is fast. Simple design and good balance contribute to fast cycles and heaped buckets. The Luhr Construction Company's machine averages two passes every minute — faster than a smaller 3-yd. rig working with the Model 4500.

There's no complicated electric motors — no restrictive trailing cable to hinder mobility. Unit drive, composed of a single diesel power package, gives you unmatched on-the-job mobility seldom found in a machine of this size. Mobility that lets you use the 4500's capacity to profitable advantage on any job.

Here's a real powerhouse with the mobility of units having much smaller capacities. Find out how the Manitowoc 4500 will fit *your* jobs. Your helpful Manitowoc distributor has all the details.

Manitowoc Engineering Corp., Manitowoc, Wis.

SHOVELS 1-5½ YD.

Manitowoc

CRANES 20-100 TON

TORQMATIC delivers brute power at the blade

A SCRAPER has to take big deep bites, swallow up to 25 yards of earth and walk away. That takes power!

The converter section of the TORQMATIC DRIVE alone multiplies engine torque up to 350%.

TORQMATIC is a matched converter-transmission team with four speeds forward, two speeds reverse. A flick of the wrist, and your operator can shift to the right gear at full power without losing the "push." It puts an end to lugged or stalled engines because your engine is always working at its top-rated output.

TORQMATIC in a scraper means a big increase in tire life, and far better handling for the operator.

Take a tip from 80 manufacturers of 122 different kinds of road-building and construction equipment. Get the Allison TORQMATIC story.

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TORQMATIC® DRIVES

CONCRETE MUSEUM . . .
continued

to 3 ft. Once reinforcing was placed we chuted in 3,500-psi concrete from transit-mix trucks at street level, or carried concrete to hard-to-reach spots by crane and bucket or buggies.

The slab over the ground floor was a little unusual in that it was circular and had a 64-ft dia with support only around its perimeter. We had to build this 1-ft-thick slab with a 3-in. camber. This was to allow for a 1½-in. settlement of forms because of the weight of the concrete, and an additional 1½-in. settlement that will take place over the next few years, again due to the weight of the concrete of so large a span.

Building the Ramp

Our first taste of the job's complexity came with construction of the spiral ramp. And the complexity came, naturally, in the forming. As the ramp spirals upwards its width increases. The slab started 13½ in. thick and thinned to 4 in. at the cantilevered edge. The circular ramp called for constant adjustment to rectangular forms.

If expense were no consideration, unlimited use of lumber and a buzz saw could have solved this problem. But we did not have an unlimited budget. We had to work out a scheme that would give us maximum reuse of the plywood panels called for on the job and a minimum of cutting, fitting, and waste.

Fortunately, the distance between ramps remains constant from the first floor up. That meant we could precut shores and reuse them without recutting or splicing. We set 4x4-in. timber shores on 4-ft centers on the ramp and cross-braced these with 1x6's. Then, we capped the tops of the shores with 4x6-in. stringers and crossed these with 2x6-in. timber joists. Where the slab thins out to 4 in. on the outside of the ramp, we built up the joists with additional lengths of wood. That made up the falsework framing.

We then laid a length of 4x6-ft sheets of ⅝-in. waterproof plywood over the joists across the ramp. Placing precut wedge-shaped plywood sections adjacent to the full sheets formed the curve.

A second section of uncut 4x8-ft sheets of plywood went alongside the wedge-shaped section.

WORK FORCE—"Men capable of doing the complex forming such as these raking roof beams have been with us for years. They have to break in new men hired from nearby."

DETAIL WORK—"One crew specializes in form fabrication and a second in production work. In this way carpenters are assigned to forming work that proves most suitable to them."

We repeated this procedure on up to the top. Thus, we retained a maximum number of uncut full sheets that could be reused. Our only waste was the wedge-cut sections. We salvaged some of these by trimming and piecing used sections together.

Re-shoring remained in place until concrete reached ultimate strength. This provided support for slabs above and incidentally for the Whiteman Power Buggies that carried concrete from hoppers to pour areas. Hand buggies supplemented the power buggies to place concrete in inaccessible spots. A P&H crane at street level picked up concrete from transit-mix trucks in a 1-yd bucket.

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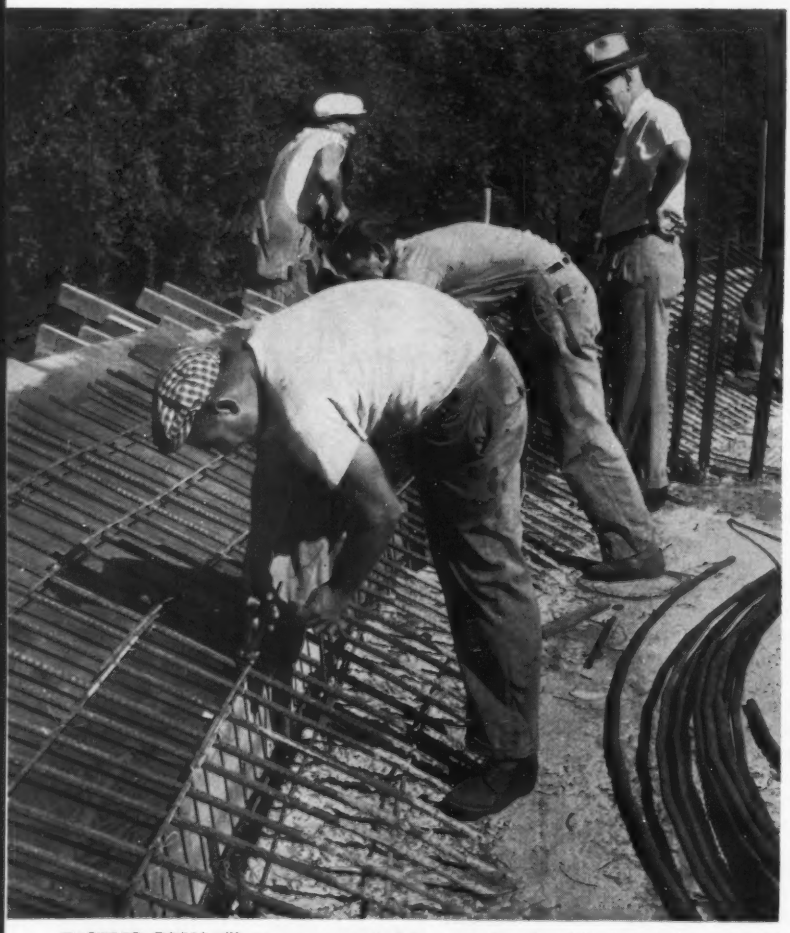
SUPERVISION—"The author (right) frequently works out problems with foremen."

FORMING RAMP—"Workmen shore ramp forms by setting 4x4-in. timber posts on 4-ft centers cross-braced with 1x6's. These are capped with 4x6-in. stringers and 2x6-in. joists."



TAPERED FORM—"It proves economical for us to let all reinforcing steel erection to reinforcing steel subcontractors. Bar Steel Co. of New York works for us on this job."

Ramp concrete specified was 3,500-psi lightweight concrete with a 3-in. slump. To insure retaining this slump during the summer and to guard against shrinkage cracks in the smooth exposed concrete surface, we added 14 oz of Plastiment to each yard of concrete. Plastiment is a densifying retarder that cuts down on concrete shrinkage even after vibration and retards setting to leave more time for working the concrete.

Once forms were stripped, we rubbed out fins in the concrete surface with a Berg concrete-surfacing machine powered by a Griffin 3-kw generator.

Building the Parapet Wall

Perhaps the most unusual construction on the job was the ramp's parapet wall. Finished, this was to be a 5-in.-thick, 7-ft-high concrete wall on the outside of the ramp. The wall rests on one ramp edge and rakes upwards at a 1-in-4 slope, tieing into the ramp above by a connecting skylight (Sketch, p 146).

This is a non-bearing wall that required a lightweight concrete sprayed into place by Gunite. Naturally, spraying the wall meant we needed only an exterior form to get the outside shape of the wall. But this form required some doing.

Plywood had to do the job because the exposed concrete was to receive no finish other than a painting. But the question was, how were we to place a single form in a circular pattern and brace it sufficiently so that it would retain its shape throughout the concreting operations.

First step was to set steel angle irons 7 ft long on 1-in-4 slopes approximately on 8-ft centers at the outer edge of the bottom ramp. We braced these against the upper ramp with lengths of steel rod that anchored into inserts under the slab. Angles formed the basic structural support for setting up the forms. They also supported horizontal reinforcing rods and welded-wire mesh.

Vertical 2x4's placed on 16-in. centers were anchored to upper and lower slabs. These were to establish the circular shape of the parapet wall. Working on tubular steel scaffolding around the outside of the building, workmen then placed full sheets of ply-

Our paver tipped and crashed

...but we were out from under in more ways than one

(Based on Company File #61474)

It was a job we'd done often—loading our paver for transport. But this time the ground was wet and uneven. When the paver was halfway loaded, the lowboy slipped out from underneath. Fortunately, nobody was hurt. But it would have cost us $850 in repair bills if it hadn't been for our Hartford Contractors' Equipment Policy.

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continued

wood up against the 2x4's.

To help bend the plywood to shape, we waled the 2x4's with double 1x6's backed with 4x6-in. strongbacks that we anchored to the upper and lower ramps with steel rods. Small pieces of concrete block served as spreaders between the angle irons and the plywood.

Workmen on the ramp then placed, horizontally, No. 4 reinforcing rods on 12-in. centers on the outside edge of the angle irons. Then, they put down a layer of wire fabric. We next Gunited a 2-in.-thick wall against the form face. When the 2-in. section had set, we placed additional rods and mesh against the exposed inner face and Gunited another 2-in. of concrete against the previously placed layer.

Specs called for a final inch of concrete to make a total 5-in.-thick concrete wall. But we left this for the final phase of the job so that the work could be done with care to wipe out any irregularities left in the second 2-in. stage of concreting.

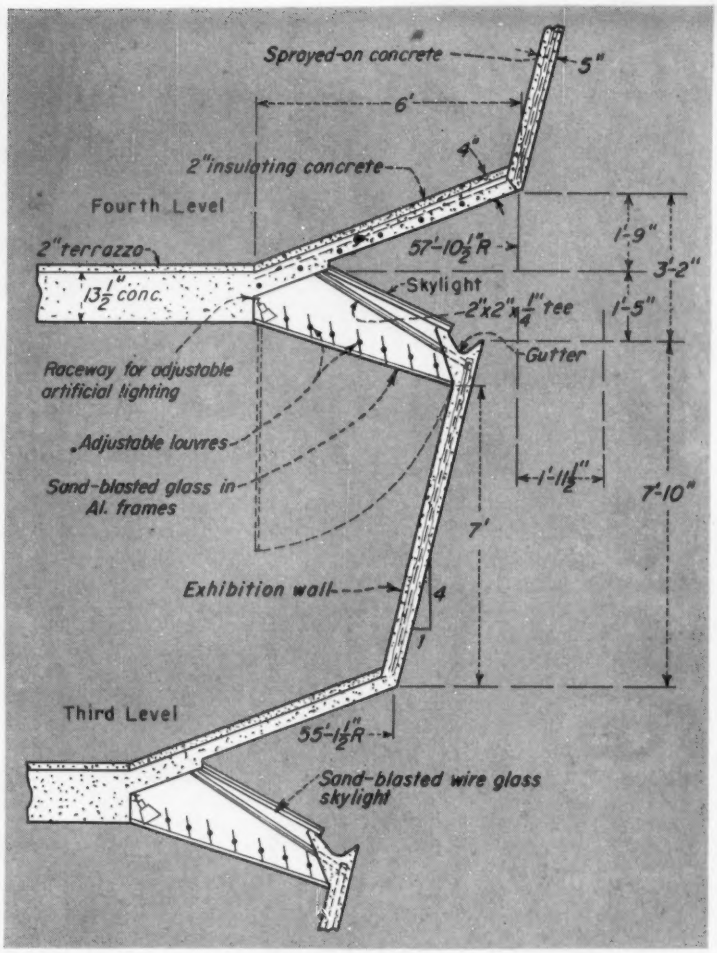
Special Work

Though ramps and the exterior parapet walls proved the largest areas of unusual construction, they by no means were the most difficult. Endless odd-shaped columns, curved windows, gutters, and smaller parapets challenged our forming know-how. Here are some examples.

At basement level Wright designed a series of small windows that resemble flour scoops. We had to build forms for them by soaking plywood and Masonite in water till pliable and shape it to braces in almost the same manner as hull timber is shaped to ribs of a boat. And we had to make these up in half sections to permit rapid setting of forms and fast stripping.

For the many 4-ft-dia hollow circular columns in the exhibition building, we made plywood forms in sets each 5 ft high (half the column height). Each set consisted of ¼-in. plywood bent to a 2-ft radius. The face was braced with 1x2's held in place by ⅝-in. horizontal plywood templets spaced 12 in. on centers.

Carpenters set the forms together when we were ready for a pour and nailed a scab between templets on opposite sides of the form to hold the units together. A second 5-ft section placed over the first established a full column form. We then added a pair of 2x4-in. vertical wales on each side of the templet at each corner and secured these with Richmond Form Tys.



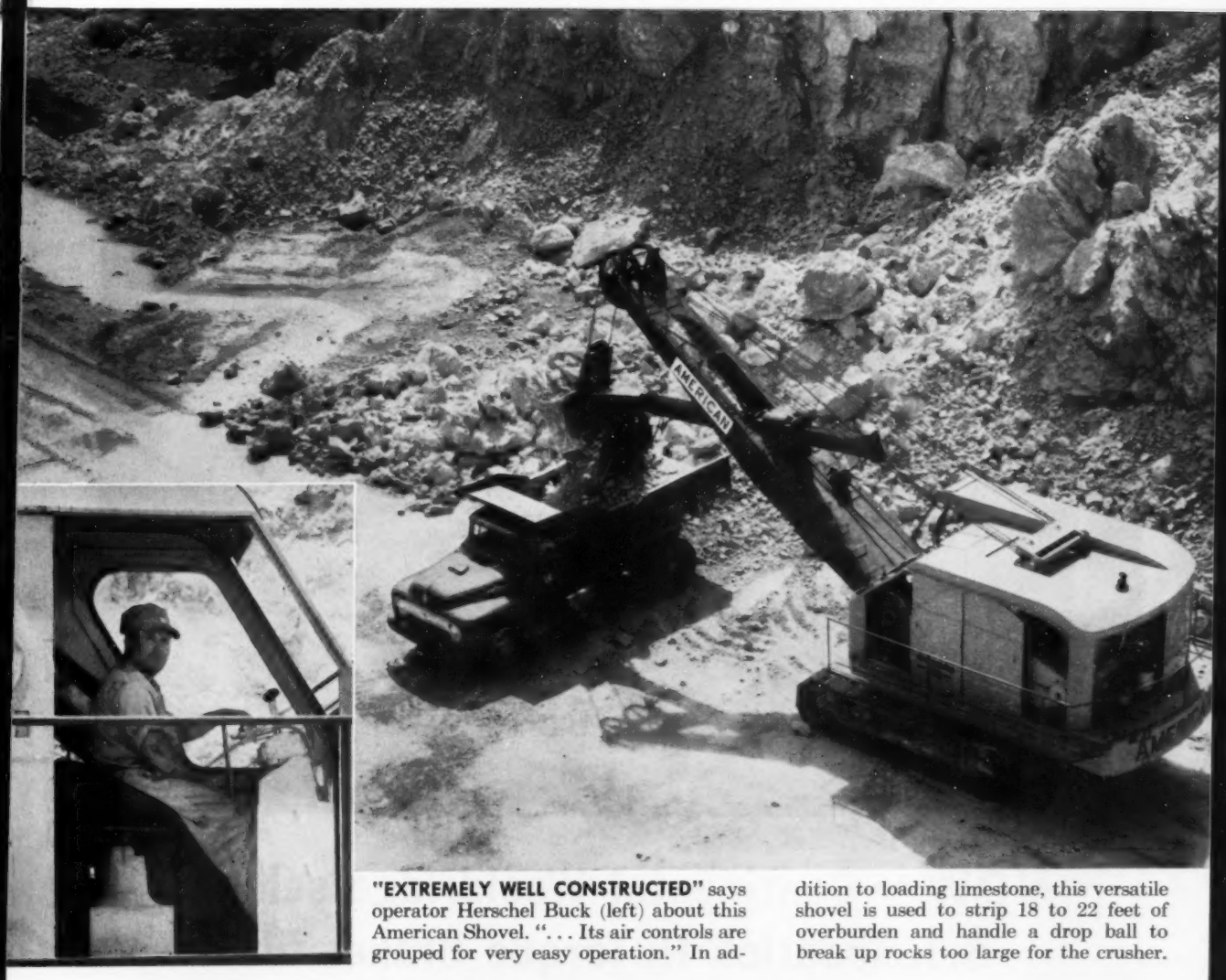
PARAPET WALLS—"Most unusual construction on job is ramp's parapet wall that requires building one outside plywood form then Guniting lightweight concrete wall."

Twelve structural webs merge over the roof dome of the exhibition hall in pairs to form six hairpins connected at the top by six small concrete compression beams. These beams rake up sharply and curve sharply. Again falsework had to be shaped and fabricated to permit pouring at least two beams and one half of a compression beam simultaneously. And to concrete the webs in this hard-to-reach roof we had to build a spiral buggy ramp of timber that circled the dome and led up to the roof's center. This ramp permitted us to buggy concrete to any portion of the dome, beams, or compression beams.

Recesses, gutters, and other special work created like problems. In many cases we had to fabricate intricate forms from which we got only one use. With our forms we had to sculpture the building. Our workmen recognized the artistic element of the building, too. They symbolized their work by piecing together sections of waste plywood into the shape of a plywood statue—modernistic, of course—which they placed at the concrete ramp approach.

They billed it as the first exhibit in the museum of art. But I think they recognized, as will visitors to the museum, that the prize exhibit of the museum is the building itself.

A number of people took important parts in the building's construction. George N. Cohen, president of Euclid constantly visited the job, as did Frank Lloyd Wright.



"EXTREMELY WELL CONSTRUCTED" says operator Herschel Buck (left) about this American Shovel. "... Its air controls are grouped for very easy operation." In addition to loading limestone, this versatile shovel is used to strip 18 to 22 feet of overburden and handle a drop ball to break up rocks too large for the crusher.

AMERICAN 1½ YARD SHOVEL DIGS 1000 TONS OF LIMESTONE DAILY

Limestone for roads, asphalt mix and agricultural use are produced in quantities up to 1000 tons per day at the Rockford Stone Company. After each shot, Rockford's big American 700 Series Shovel moves in quickly and loads trucks feeding the primary crusher. Even at such high production rates, the American Shovel has enough free time to perform other important jobs.

Manager of the Rockford, Ohio firm, William E. Beerbower says "The American is a well built machine—it has easy access to operating parts for maintenance or repair. These are two of the main reasons why we decided on American." He reports both operating and maintenance costs "at a minimum"!

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Secret of the B. F. Goodrich Hi-Torque Brake's amazing power is the exclusive hydraulic expander tube actuation. Providing equal pressure under each of 12 shoes in the B. F. Goodrich Hi-Torque Brake, this full-circle actuation allows shoes to follow drum eccentricities. Lining pressure is equalized—stops are smoother as well as faster—and there is less chance of fade even during long downhill runs. In addition, torque is always equal in forward or reverse.

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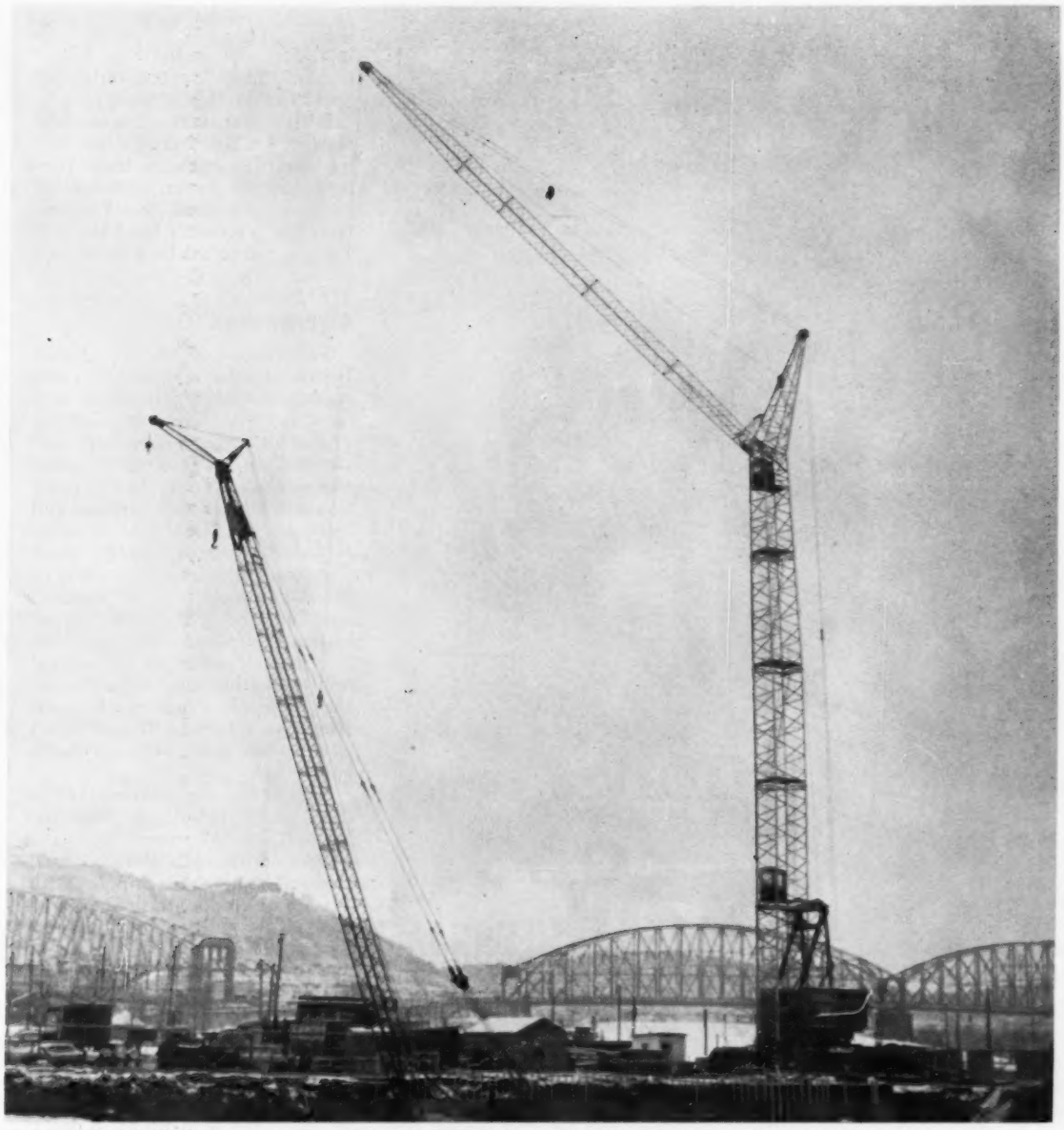
Continental-Wooldridge self-propelled Dumper and Scraper Models CWD-214, CWD-321, CWD-221, CW-215, CW-220, and high capacity tractor-drawn Scrapers, have capacities up to 30 yards struck and 39 yards heaped. 22″x 7″and 26″x 7″ B.F.Goodrich Hi-Torque Brakes provide maximum stopping power.

B.F.Goodrich Hi-Torque brakes



DAVID AND GOLIATH—Peine tower crane with 145-ft vertical tower and 125-ft jib dwarfs U.S. built rig. German crane does work of hoist tower and concrete buggies on erection of 23-story Pittsburgh Hilton Hotel. Contractor expects to cut handling costs 30%.

German Crane Invades U.S.

A GIANT CRANE BOOM, towering over the crane-congested horizon of Pittsburgh's point area, is atracting some interested second glances from construction men. A similar one in Binghamton, N. Y., already has caught the first glances.

The booms belong to a German-invented tower crane, newly introduced to the United States. Turner Construction Co. of New York is experimenting with it on their erection of the $15-million Pittsburgh Hilton Hotel. And Sordoni Construction Co. of Forty Fort, Pa., has set one up for their Sheraton hotel job in Binghamton. The crane, called the Universal-Peine crane, is manufactured in Peine, West Germany, and distributed in the United States by Universal Mfg. Co. of Zelienople, Pa.

Universal describes it as a gantry type traveling tower crane. An unusually high vertical tower, riding on rails, carries a long jib that pivots from the top of the tower. Besides performing

MAKING DEBUT—Smaller model makes trial run on rails at job in Binghamton, N. Y. This crane, leased by Sordoni Construction Co., was first to reach the United States.

normal crane functions, it replaces a combination of hoisting tower and runways for the erection of tall buildings. This multi-role feature is probably its main advantage over conventional cranes. As a crane alone, its performance is comparable, but not superior, to other types of cranes now on the market.

Separate electric motors power each of the four crane operations. This means that (a) traveling along the rails, (b) raising or lowering the load, (c) luffing—raising or lowering the jib—and (d) slewing—rotating the jib—can be performed singly or all at the same time.

Being an electric crane, its operation is very smooth, and an operator can learn how to run it quickly. Two four-way levers control all four movements.

The crane comes in seven models, each of which can be varied in size with different sizes of tower and jib. The largest size can operate at a height of 333 ft above ground. The manufacturer claims it is the tallest tower crane in the world. Ten of these large models have been built, including the one at Pittsburgh.

The Peine crane is popular in Europe and has handled jobs in Asia, Africa, and one in Canada. Until February of this year no American contractor had tried it in the United States.

In February, Sordoni leased the first model to come to the U.S. and set it up for their Binghamton job. This was a medium-size model, called the Type 40/50.

In March, Turner brought in the second machine, the giant Type 92/120, for their Pittsburgh job. More are on the way, but at present these are the only two operating in this country.

Both machines have just started working here so it is still too early to measure their performance. However, advance indications are good, and Sordoni, who had a month's head start on Turner, like what they have seen of the Universal-Peine so far.

At Pittsburgh

Turner picked the Pittsburgh Hilton job to try out the new crane because the building is a natural for this type of machine. The structure is tall enough (23 stories) so an ordinary crane alone could not handle the erection without a hoisting tower and runways. The material is reinforced concrete. Concrete, steel, and forms require a great deal of small-lot handling, a function that suits the Peine crane. Turner estimates that the machine will cut placing costs by 30%. And finally, the building is narrow, so the crane can reach most points from one side, and Turner won't have to lay track all around the site.

This crane has a tower 145 ft high and a 125-ft jib. With the jib at 15 deg the reach from the center of the rails is 131 ft and the pulley height is 178 ft. With the jib at 75 deg, the reach is 63 ft, and the pulley height 266. An extra section could be added to the tower to extend the working height to 333 ft.

The lifting capacity is not large, but it is sufficient for the materials on this job, including the 2-yd concrete bucket that Turner plans to use. The capacity of the crane with jib at 75 deg is 11½ tons. This drops to 2½ tons at 15 deg.

The crane moves along its tracks at a maximum speed of 128 fpm. It slews at 0.7 rpm. The maximum hoisting speed is 230 fpm, but this slows considerably as the load approaches capacity.

The seven electric motors, including four for travel, require 94 kw of 440-v power when all are running. The largest of the motors is the 50-hp motor on the winch. Turner buys power from outside sources. A portable generator would work just as well if an outside source were not available. A reel on the side of the crane chassis automatically pays the electric cable in and out as

BOND BREAKER, MOISTURE BARRIER! VISQUEEN TRADEMARK FILM SAVED MONEY BOTH WAYS

Ross & Farthington Construction Company, Wichita, Kansas, scored twice in saving when they used VISQUEEN film in construction of the Osage City School. Architects Williamson, Loebsack and Associates specified VISQUEEN film as a bond breaker because the film produces better concrete surface finishes and achieves great financial savings for contractor and Board of Education through re-use of one set of forms.

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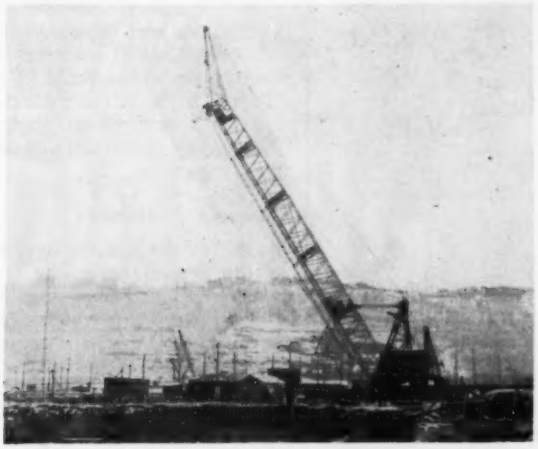
Tower, chassis, and cables are assembled on ground . . .

Crane's own winch lifts tower without outside help . . .



Tower rises fast. Whole erection takes only 2 hr . . .

With tower in vertical position, jib can be raised.

the crane moves along the track.

One feature of the larger models is a remote control arrangement. With an extension cable, the operator can control the crane from any point on the building so that he always can see what he is doing. This is faster than operating blind with only someone's hand signals to guide him.

In addition to the remote control, there are three regular, identical control stations on the crane itself—one at the base of the tower, another in an enclosed cab 30 ft up the tower, and a third in a cab 165 ft up the tower. When erection reaches the upper level and visibility from below gets bad, Turner plans to station operators at both top and bottom.

The crane weighs 61 tons unballasted. To operate it, 44 tons of ballast at the base is needed. Four bins, built onto the chassis and containing sand or gravel, supply this weight. Additional ballast is needed during erection of the crane while the heavy main tower is swinging upward to its vertical position. Turner piled 6 tons of reinforcing steel on the back of the chassis for this purpose.

During the erection the jib is attached along the underside of the tower. When the tower reaches a vertical position, the jib is swung up to its working angle.

Harvey V. Debo is project manager for Turner.

At Binghamton

Sordoni is in a different situation at Binghamton. The building here is only six stories high and the Type 40/50 crane with its 90-ft tower can easily handle the job. But this size crane is comparable to the larger-sized U. S. cranes, so the Peine rig has more potential competition at Binghamton than it does at Pittsburgh.

Russel Ide, superintendent for Sordoni, thinks that the Peine crane will be more effective on this job. Its initial cost of $34,000 is several thousand dollars less than the cost of a truck or crawler crane with comparable reach at the six-story level.

A U. S. crane of this size probably would beat the Peine in lifting capacity. The Peine handles less than 2 tons at 15-deg jib, although it can handle up to 9 tons at shorter reach. This means that Sordoni has to substitute a ½-yd concrete bucket to reach the far

side of the building. Ordinarily they pour with a 1¼-yd bucket.

However, as with the Pittsburgh job, the biggest saving is expected to be in placing steel and concrete, and here the Peine tower concept seems to have a definite advantage. Superintendent Ide figures that the crane eliminates a 4 to 5-man crew on concrete buggies and a carpenter crew working part-time on runway construction.

Operating figures for this model are as follows: traveling speed, 128 fpm; maximum hoisting speed, 208 fpm; and slewing speed, 1.2 rpm.

Sordoni hesitated at first about trying the new rig. They were uncertain how unions would react, and they figured a rail-mounted crane might be too limited in movement for general construction work. But neither of these problems caused any trouble.

One operator and one oiler easily handle the machine and no extra electrical maintenance man is needed. The choice of having a second operator at the upper level for extra visibility is entirely up to the contractor. Sordoni likely will not use a second man on a building of this size.

Ide was pleasantly surprised by the mobility of the crane and the speed of assembling it in the field. It moves to the site on tires, and is hauled by a truck tractor. The crane erects itself with no auxiliary equipment in a few hours. The luffing winch lifts the rig so that the road axle can be removed.

If extra mobility on the rails is needed, special wheels allow the rig to negotiate curves of up to 11 deg. So far a 200-ft straight stretch has been sufficient at both Pittsburgh and Binghamton.

Sordoni is still working on the lower floors of the building where savings in handling material are not significant. But Ide expects these savings to develop as the building grows.

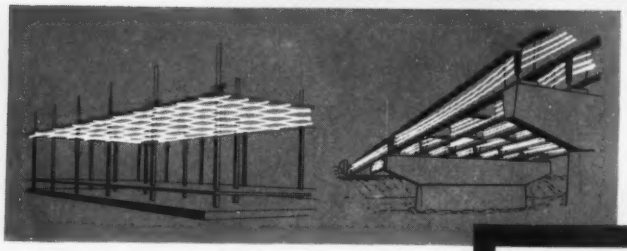
General Features

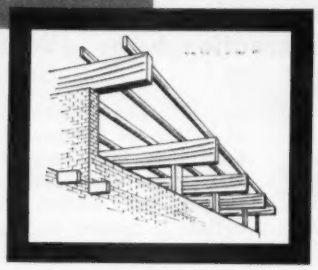
One of the promising features of the new crane is low maintenance costs. The manufacturer claims that $250 worth of spare parts will cover maintenance for several years on the smaller model. A similar package for the $95,000 crane at Pittsburgh would cost $1,400. If these claims prove correct, cheap maintenance and low down-time will be a big asset for the Peine crane.

The rig does appear to be simply and efficiently designed. Single cable winding on all drums prevents cable wear. The ground helical gears run in an oil bath; no gears, clutches, or couplings run in the open.

Stability appears good. The gage of the track is a wide 19½ ft for the Pittsburgh model and 12½ ft at Binghamton. According to German engineers, the crane can operate with load in winds up to 50 mph and without load in winds of 100 mph with the stability factor at a safe level.

Because of the cost of the machines and the relatively specialized applications for them, Turner and Sordoni feel that the key to using them effectively is to keep them busy all the time lifting a variety of materials. Both contractors plan to do this on their current jobs.





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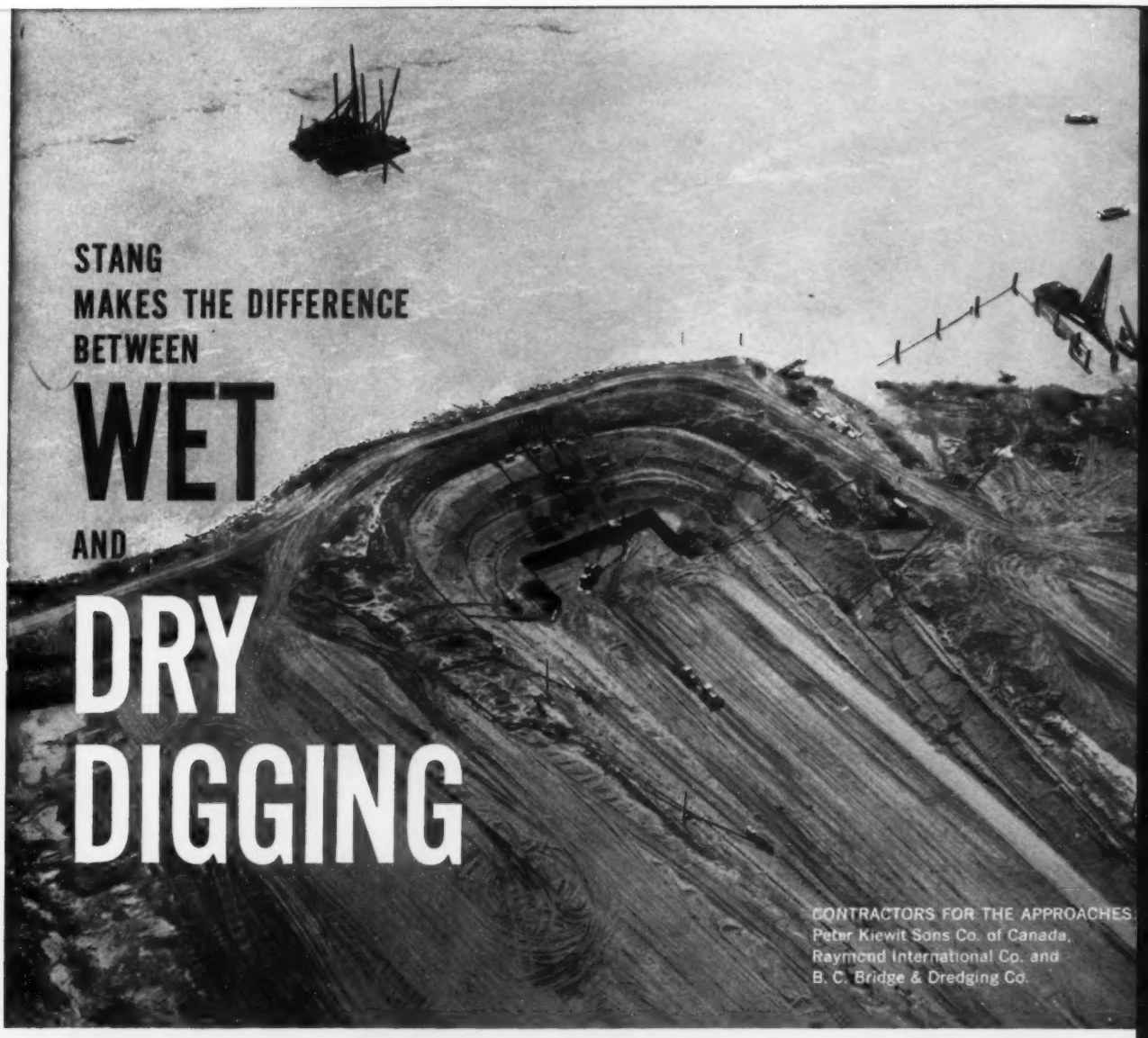

Deas Island Tunnel approaches DUG IN THE DRY—thanks to Stang dewatering

Taking the initial step in construction of Canada's first subaqueous highway tunnel, which joins Deas and Lulu islands in the province of British Columbia, contractors for the approaches to the Frazer River called for dewatering by the John W. Stang Corporation. In record time, Stang engineers designed and had operating a deepwell turbine system on the Deas Island side and a wellpoint system on the Lulu Island side, making the excavations on both island approaches COMPLETELY DRY TO A DEPTH OF FIFTY FEET, AT THE VERY EDGE OF THE RIVER.

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GRADER ATTACHMENT—A motor grader with steel pan slung underneath passes over freshly dumped concrete to mold median strips. Usually two passes are required.

Job-Built Pan Molds Median Strip

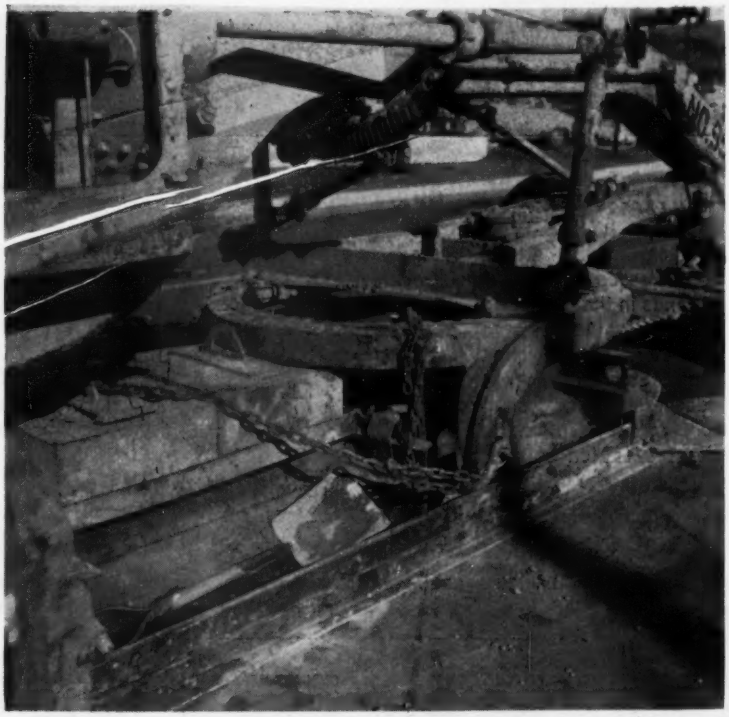
A TRAVELING FORM attached to a motor grader saves time and labor in placing concrete median strips on multi-lane highways. Slung beneath the circle of a grader, the form passes over concrete dumped along the strip and molds it into shape. The new device eliminates form setting and hand placing and finishing of concrete.

Developed by contractor Jansen & Schaefer of Pekin, Ill., and dubbed by them the "Metal Mule," the form is simply a steel pan shaped to the section of the median strip. The one they made for a highway widening project in Creve Coeur, Ill., is a 48-in.-wide, 6-in.-deep inverted trough with a flat top and rounded corners. Angles run along each edge of the 8½-ft-long form and provide a base for it to slide on. A plate projecting below one edge fits against the edge of the pavement and guides the form on line. A chute on the top of the form serves as an escape hatch for excess concrete, and a steel plate across the rear acts as a float. It can be raised or lowered to adjust the depth of the strip.

Two 800-lb concrete blocks on top of the form serve as counterweights. The total weight of the form plus counterweights is 3,100 lb. The weight combined with the downward pressure of the grader circle keeps the sliding form pressed down tightly over the concrete. The concrete is a stiff, dry mix so considerable pressure is needed to prevent the form from riding up on the heap of freshly dumped concrete.

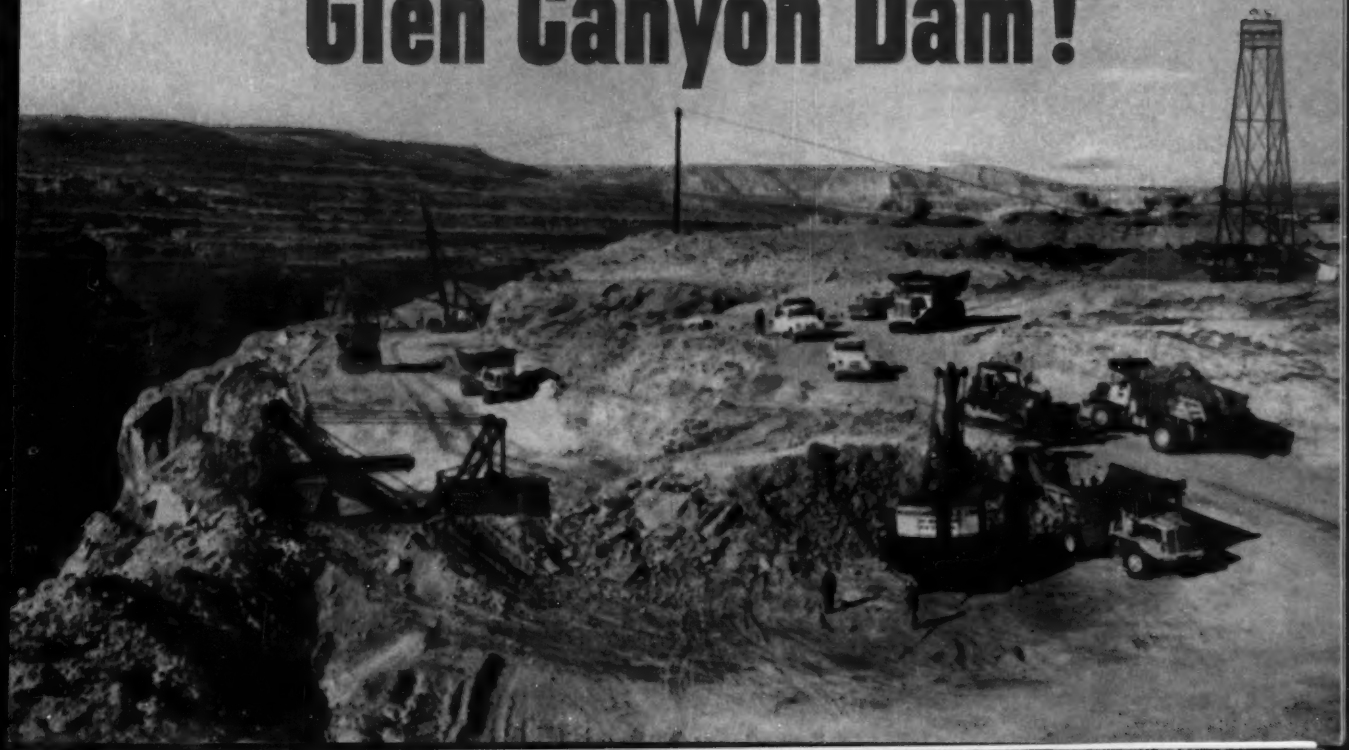
Chains attach the form to the front axle housing and to two points on the grader circle. This is where the importance of the grader as the power unit comes in. The operator can lift the form entirely free of the concrete by raising the grader circle. Then he can back up over a freshly molded strip to make an additional pass without disturbing the concrete. Ordinarily two passes are necessary to get a finish that is smooth and free of air bubbles. No other finishing work is required except for touching-up around the edges.

The contractor completes from 2,000 to 3,000 ft of 6-in.-thick median strip a day with the traveling form. He reports that the new device does a quality job.



STEEL PAN—The form is an inverted trough made of scrap metal. Concrete block counterweights plus downward pressure of grader circle press pan into concrete.

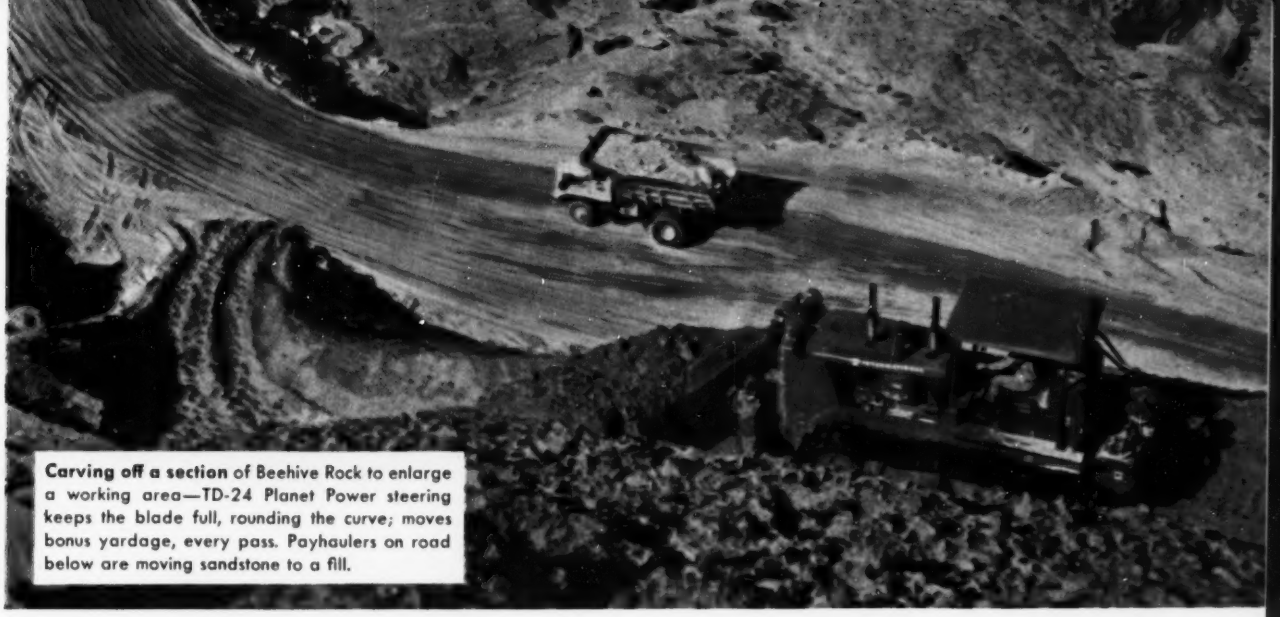
Merritt-Chapman & Scott mobilizes International® fleet to build colossal Glen Canyon Dam!



Noon time is inspection time as Merritt maintenance men, using International welder and shop trucks, roll up to Marion power shovel for fast, on-the-job service.

$108 million contract crawlers, haulers,

"95" Payhauler fleets keep busy on both sides of the 700-foot-deep canyon. These three units are hauling shovel-loaded rock from spillway excavation on the huge Glen Canyon Dam project.



Carving off a section of Beehive Rock to enlarge a working area—TD-24 Planet Power steering keeps the blade full, rounding the curve; moves bonus yardage, every pass. Payhaulers on road below are moving sandstone to a fill.

rolls on schedule with International® trucks and service!

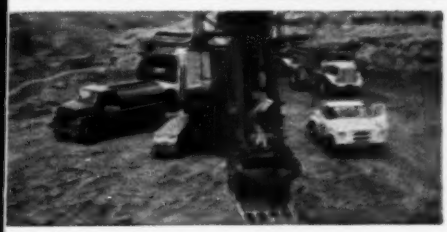
MERRITT-CHAPMAN & SCOTT CORPORATION is shooting to complete its $108,000,000 Glen Canyon Dam contract—biggest competitively bid job ever awarded to a single contractor—well ahead of the specified seven-year limit. A big fleet of International equipment helps keep this huge Bureau of Reclamation project on the Colorado River in Northern Arizona rolling at record pace.

Planet Power-steered TD-24 crawlers prove the worth of full-time live power on both tracks—blading bonus loads 'round the curves. Grade-beating "95's" high-balling rock show why a load-and-road-matched Payhauler® fleet—bonus-powered with turbo-charged diesel engines—belong on this tough, high-altitude job. International trucks are here, there, and everywhere—handling a multitude of different material, equipment, and personnel-carrying assignments.

And complete International parts and service is minutes close to insure high performance availability of every International machine.

8-passenger International Travelall, with hill-climbing four-wheel-drive, transports engineers and surveying equipment over rough terrain right to the dam site.

Here a rugged International truck with boom rig is used by electrical linemen to set up important transmission lines on the east side of the Colorado River.



On-the-spot maintenance. International shop truck moves in as shovel takes "fuel break" from International cab-forward tanker.

Big capacity. Six-wheel heavy-duty International truck with 5,000-gallon tank sprinkles water for compaction of road base.

Ready for any emergency. Merritt medical crews use International Travelall ambulances, complete with oxygen and first aid equipment, to provide mobile first aid. One stands by on each side of the river.

Making ready for power. Conventional International truck with engine-driven auger sinks holes for transmission lines.

Track-roller lubrication of the TD-24's only needs to be done each 500 working hours. A cab-forward International truck, provides an efficient, mobile "service station." This compact International was chosen for exceptional maneuverability.

Prompt, performance-backing International service ... company and distributor... *keeps 'em rolling!*

The complete service resources for which International is world-famous are on the job for Merritt-Chapman & Scott—to help keep all International equipment rolling and producing!

It makes no difference that the job is remotely-located and 125 miles from the nearest rail-head. International, the distributor, and the dealer concerned have augmented existing parts stocks and facilities—have set up supply channels that assure on-the-spot parts availability.

Specialized distributor and company servicemen are so promptly available it's as convenient as a "down-the-street" service department.

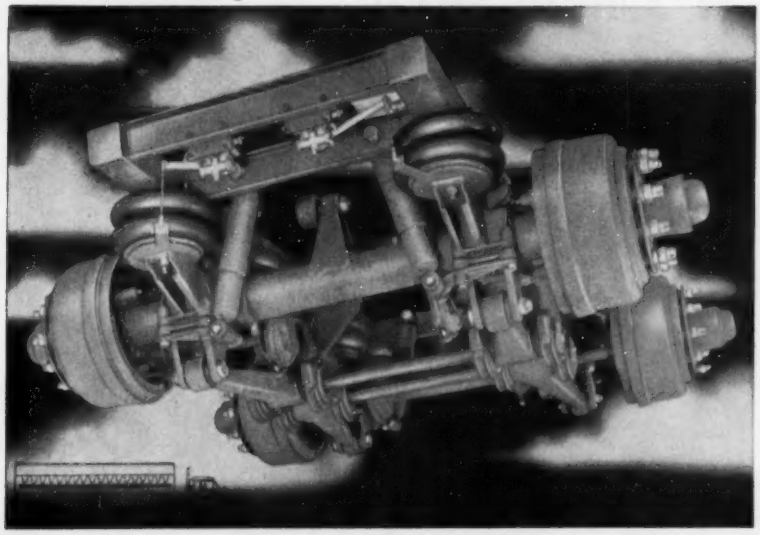
YOU CAN HAVE THIS SAME big-capacity, specialized International performance—wherever you operate and on whatever scale—and with top performance-backing company, distributor and dealer service. See your International dealer or distributor for a demonstration of the construction equipment and motor trucks you need for high-balling your next job!

International Harvester

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Motor Trucks . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines.

TORQUE TALK FROM CLARK® EQUIPMENT



TONS OF CARGO FLOAT ON AIR

with new Clark Air Suspension System for highway semi-trailers

Damage to fragile highway cargo or empty trailers in transit can now be virtually eliminated. Key is Clark Air Suspension. In this new system, doughnut-shaped "air-springs" carry full weight of trailer and cargo. A gentle cushion of air absorbs road shock, literally "floats" cargo and trailer over the bumps with a ride approaching passenger car softness. Empty, for example, a Clark Air-Suspended trailer develops a spring frequency of only 95 cycles per minute; loaded, only 89 cycles per minute.

Lateral roll and sway are minimized by an ingenious system of pivoted torque arms and torsion bars which take the full force of side loads and absorb torsion resulting from brake torque. Trailer loads need no longer be precisely balanced. Offset loading is accommodated by a system of automatic air valving, which feeds and bleeds the air springs to keep the trailer bed level at all times. When loading or unloading trailer, air reservoirs automatically adjust to support bed at normal running height.

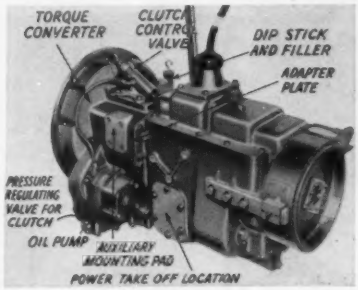
A safety pressure regulator valve, on the line leading from the truck's compressor, is designed to shut off at 60 psi...leaving ample air pressure for the service brake system.

Clark Air Suspension assemblies come as complete packages, ready for installation on new or in-use semis, in single and tandem units. Other advantages include lower trailer maintenance costs and substantial weight reduction possibilities for trailer manufacturers.

NEW POWER TRAIN DESIGNED FOR STOP & GO OPERATION

Designed specifically for off-highway and stop-go operations, Clark Equipment Company's new TransVerter is ideal for such equipment as house-to-house delivery trucks, buses, garbage trucks and various types of construction machinery. Rated for engine torque output up to 325 lb-ft, the TransVerter power train package consists of a torque converter, hydraulic disconnect clutch and standard transmission. Because of its compactness—only 8 inches longer than a conventional transmission and clutch—the TransVerter can often be installed by the original equipment manufacturer without major re-design of his line.

Operational advantages of the new Clark power train include elimination of engine stalling and lugging . . . sharp reduction in gear shifting, to the point where most work can be performed in the same gear . . . fine inching control, simply by working the throttle. Provision is made for SAE power-



take-off attachments, to be driven by the torque converter. The hydraulic disconnect clutch is an off-on type unit that does not require "letting in" or "easing." A variety of clutch releases can be provided, including a shift lever button or a conventional-looking pedal raised slightly from the floorboard.

FOR YOUR READING RACK

NEW AUTOMOTIVE BOOKLET

Dramatic portrayal, in 24 pages, of Clark's basic line of automotive components. Includes illustrations of the Clark constant mesh and synchronized transmissions, TransVerter, StepMatic, power-shift transmissions, torque converters, agricultural units; also automotive driving and steering axles; planetary, industrial and trailer axles; air suspension assemblies; rear axle housings and electric steel castings.

CLARK FULL-LINE BOOKLET

A 48-page, full-color booklet in handy pocket size is your condensed guide to the entire product line of Clark Equipment Company. Automotive components, materials-handling equipment, construction machinery—all are described in concise detail. Basic information on the eight Clark plants and brief insight into corporate philosophy make this booklet a "must" for your reading rack.

For Further Information

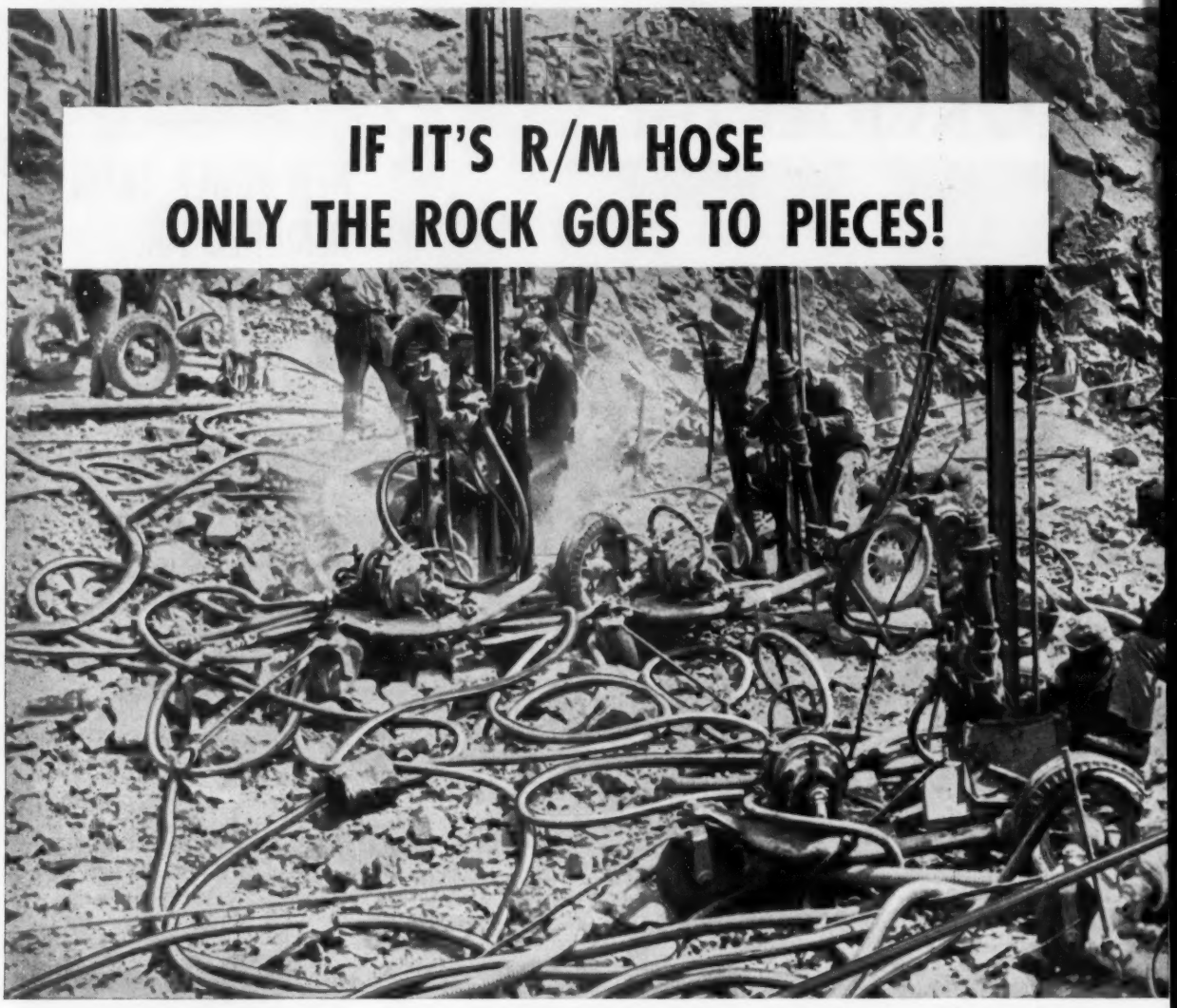
. . . and full details on any of Clark's automotive components, simply address a card or a call to:

CLARK EQUIPMENT COMPANY

AUTOMOTIVE DIVISION

Buchanan or Jackson 6, Michigan

TransVerter and StepMatic are trade-marks of Clark Equipment Company



Long Life features of HOMOFLEX HOSE Assure

for Your

"More Use ~~per~~ Dollar"

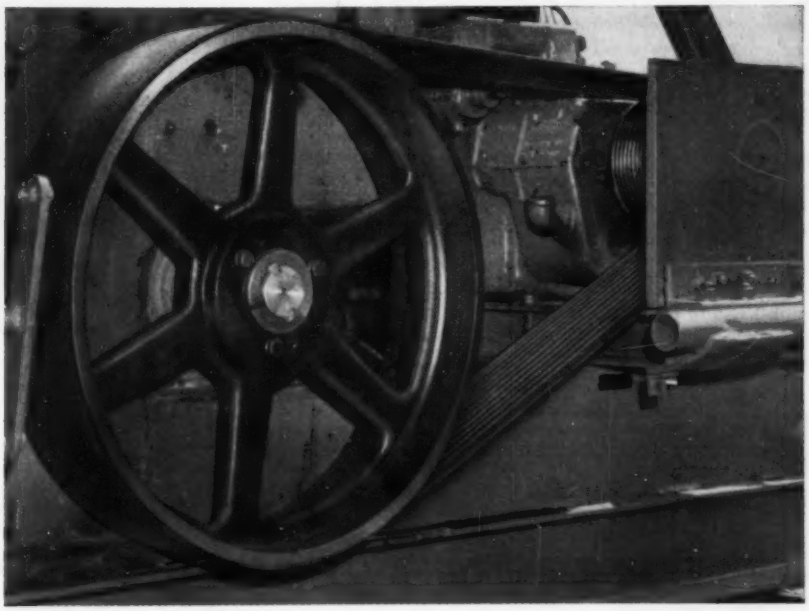
Rugged Homoflex Hose is R/M's exclusive construction for use with air, water, other fluids and gases. Strong enough to stand up under the toughest conditions, yet light in weight and flexible as a rope for easier handling . . . even on the roughest, rockiest job site. Exclusive R/M features make Homoflex Hose do a *better* job . . . and *last longer.*

- Mandrel-Made — No Pre-Set Twist, Extremely Flexible
- Inseparable Cover, Strength Member and Tube
- Coils and Uncoils Freely in *Any* Direction, Resists Kinking
- Balanced Homogeneous Construction Throughout
- Uniform Inside and Outside Diameters — Easier Coupling
- Withstands High Pressures and Surges with Wide Margin of Safety

R/M has a hose construction engineered to meet *every* job requirement. Write for Bulletin #6879.

RAY-MAN CONVEYOR BELT— Tough, flexible Ray-Man resists gouging and tearing. Double compensation relieves stress on outer belt plies . . . assures longer belt life and lower cost. High fastener holding ability. Other types available for every bulk materials handling requirement. Write for Bulletins.

R/M POLY-V® DRIVE— New, patented heavy duty drive delivers up to 50% more power in the same space as conventional multiple V-drive . . . equal power in as little as ⅔ the space. Single unit V-ribbed belt design eliminates multiple-belt "length matching" problems. More constant speed ratios, less wear on belt and sheaves, smoother running. Write for Bulletin #6638.



Inseparable Cover, Strength Member and Tube
Balanced Homogeneous Construction Throughout
Coils and Uncoils Freely in Any Direction, Resists Kinking

*Poly-V is a registered Raybestos-Manhattan Trademark.

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MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

IT'S BIG • IT'S PROVEN • THE NEW

35 TON CAPACITY CRANEMOBILE®

HIGH LIFTS—New 35 Ton CraneMobile has added stability to lift bigger loads at greater radius. Maximum boom raises from horizontal to highest working position without assistance.

HEAVY LIFT—Fine balance with added power and weight handles heavy lift jobs with ease and precision and with power controlled lowering against machinery and engine.

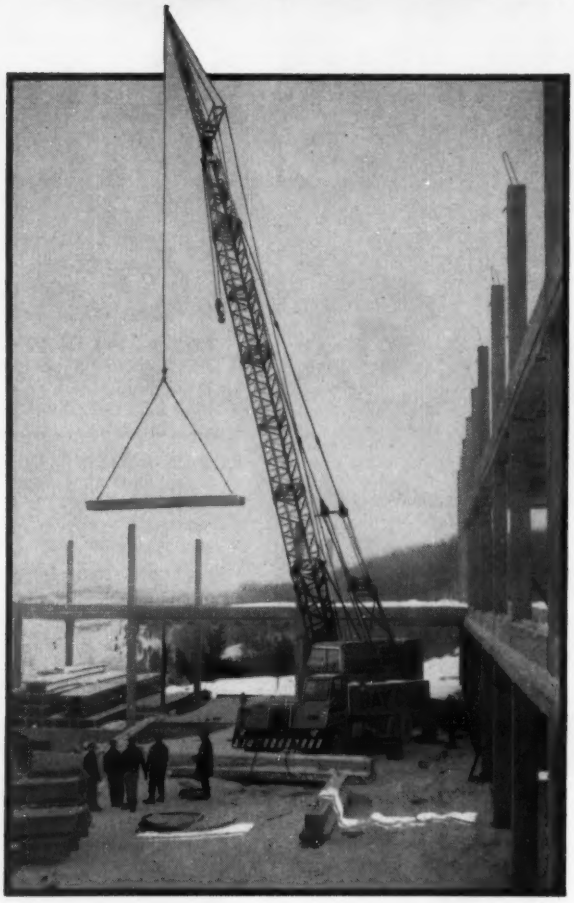
FAST, POWERFUL BOOM HOIST is power operated, fully independent . . . raises boom and/or load through internal 2-shoe friction clutch . . . lowers through an overrunning type clutch to give precise control at all boom angles.

PIN-CONNECTED BOOM of high strength alloy steel main chords and bracing is quickly assembled or dismantled. Supported by cable suspended floating bridle and matching cable pendants the boom may be lengthened or shortened without changing boom hoist cable.

TANDEM DRUMS—Drums, mounted in ball bearings and in tandem for best cable lead, are of cast steel with nickel-iron brake flanges for long wear, better service. Clutches and brakes are external contracting band type. Main hoist drum has capacity of 650 ft. of ¾ in. cable . . . front drum handles 440 ft. of ¾ in. cable . . . assuring ample cable for any job.

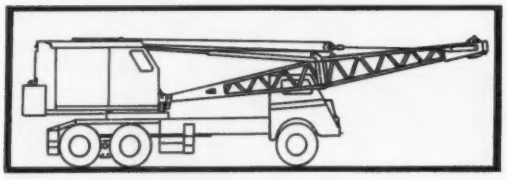
POWER LOAD LOWERING is a special device furnished for accurate control. Lowers heavy loads at 6 in. per sec. on single line . . . 1 in. per sec. on a 6-part block without using brake.

CRANE CARRIER is a heavy-duty pneumatic-tired carrier, designed and built by BAY CITY, to provide maximum mobility and flexibility for high speed road travel or off-the-road service. Will climb a 40% grade . . . speeds range to 29 MPH.



273

Sperber Crane Corp., So. Kearney, N. J., recently added this new 35 Ton crane to their fleet of CraneMobiles (above). It is shown handling pre-cast concrete sections weighing 4 to 5 tons each, working at a radius of 50 to 55 feet with 80 foot boom and 30 foot jib. • Wheelbase 222 inches. Height 12′-2¼″. Carrier—10′-1¼″ wide. Overall length with 30′ boom in traveling position 45′ long. Gasoline engine for crane 525 cu. in. displacement, 115 net HP. Carrier 779 cu. in. displacement, 221 net HP. **Write for full specifications on the new, big 35 Ton CraneMobile.**



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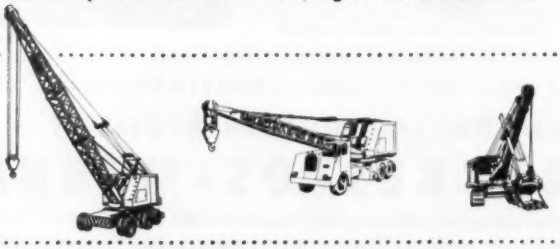
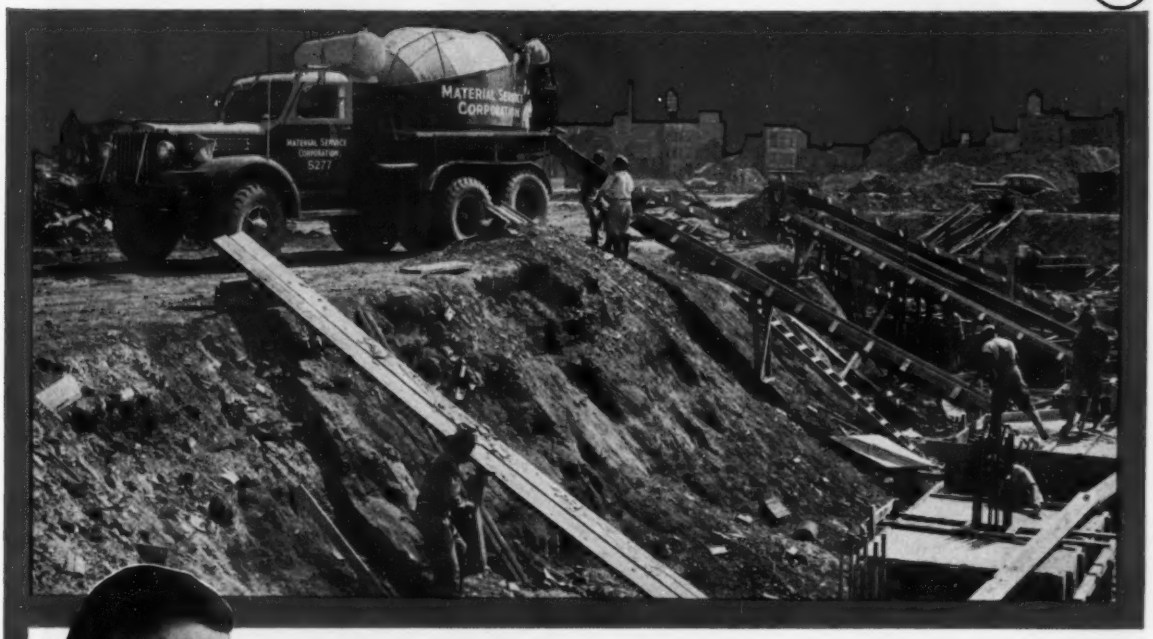
SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS



RCA RADIO . . . FIRST CHOICE OF THE LEADERS



Says "Al" Fish, Operations Manager, Material Service Corp., Chicago

"I can personally vouch for the reliability of our RCA Radio"

Mr. E. R. "Al" Fish, Operations Manager, Ready-Mix Division, Material Service Corp. is sold on RCA 2-Way Radio as a service tool because they have found it of highest reliability when they need it most. With over 200 vehicles, mixers, service trucks, and supervisors' cars—all radio-equipped, the *reliability* of RCA 2-Way Radio contributes greatly to the success of the operation.

On all RCA mobile radio equipment, reliability stems from features and benefits that only the leader in radio can offer, including low standby battery drain, longer component life. "Split Channel" readiness and "Quiet Channel" to eliminate "channel chatter"—and RCA Service to keep equipment operating at its peak.

"Minitrol" miniature microphone, controls and speaker combination greatly increases dispatching efficiency.

Find out at once how RCA 2-Way Radio can assure you maximum satisfaction, minimum maintenance, actually save you thousands of dollars! Purchase or lease agreements. Use handy coupon below for fastest service . . .

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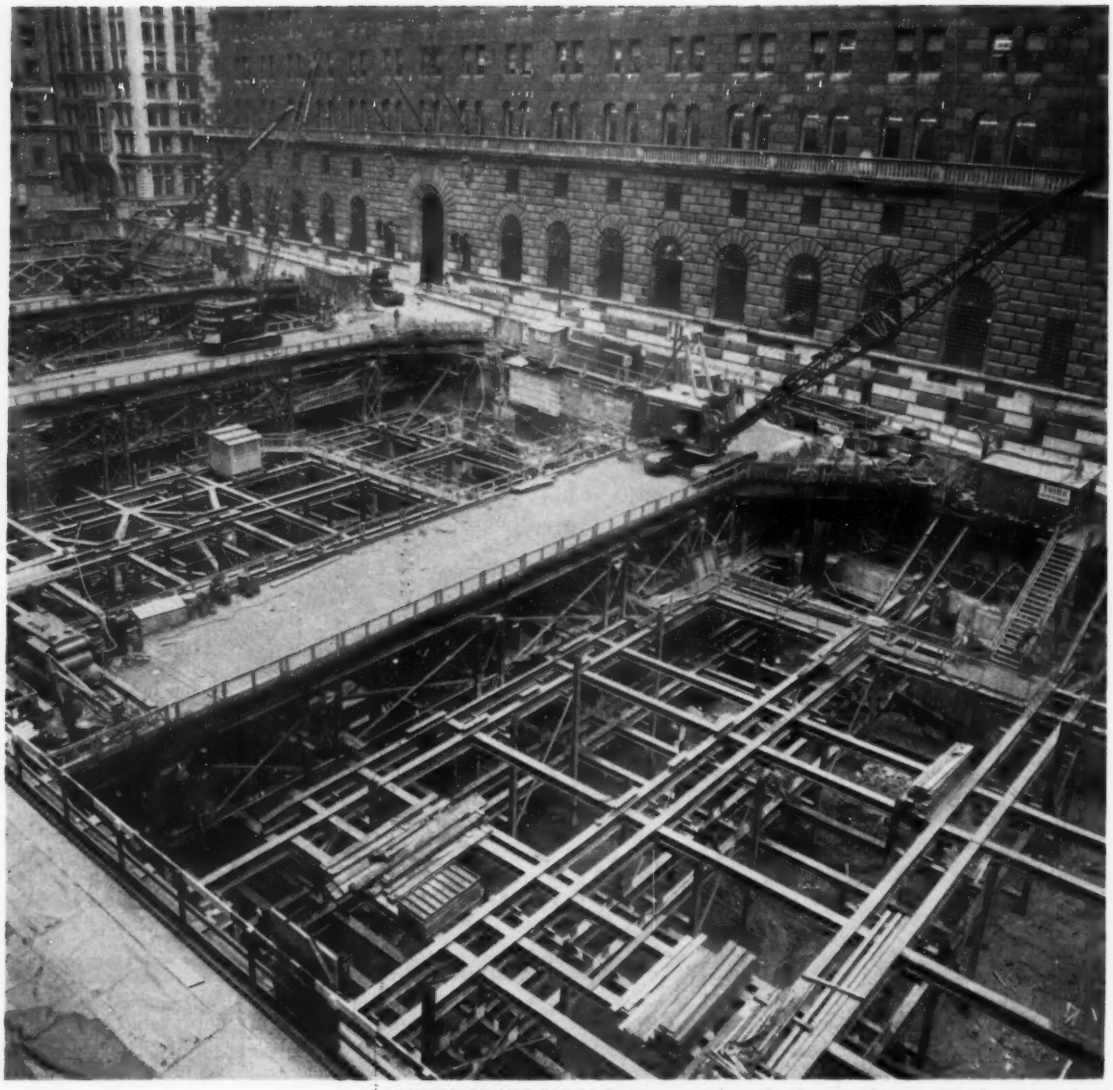


TRESTLE-RIDING RIGS—Cranes move along the three trestles spanning the site to place bracing and clam out material as excavation proceeds in the block-square pit.

Permanent Bracing Shores Open-Pit Foundation 85 ft Deep

Stressed-steel cross bracing holds foundation walls at three levels. Supporting piles are extended into hardpan ahead of excavation.

FOUNDATIONS for the 60-story central office building of the Chase Manhattan Bank rest on bedrock 85 ft below sidewalk level in the biggest hole ever dug in the Wall Street section of New York City. Because bank officials wanted the additional basement space, designers specified an open-pit foundation instead of the pneumatic caisson type.

It makes an unusually difficult and complicated job for joint-venture contractor Foundation-Brewster-Miele. They had to:

- Cut off a water-bearing layer of sand and gravel with a chemically solidified dike.
- Excavate a trench down to bedrock for the heavy concrete foundation walls that enclose the site.

- Place a stressed steel cross-bracing system that will become a permanent part of the basement structure.
- Cut through a dense 35-ft layer of hardpan that piles cannot penetrate.
- Extend piles supporting the cross-bracing members step-by-step in holes dug out with jackhammers.

Project manager Lou Miller got the work started by digging with two 34B Bucyrus-Erie 2½-yd shovels down to about 20 ft below sidewalk level. This established site grade just above ground-water level.

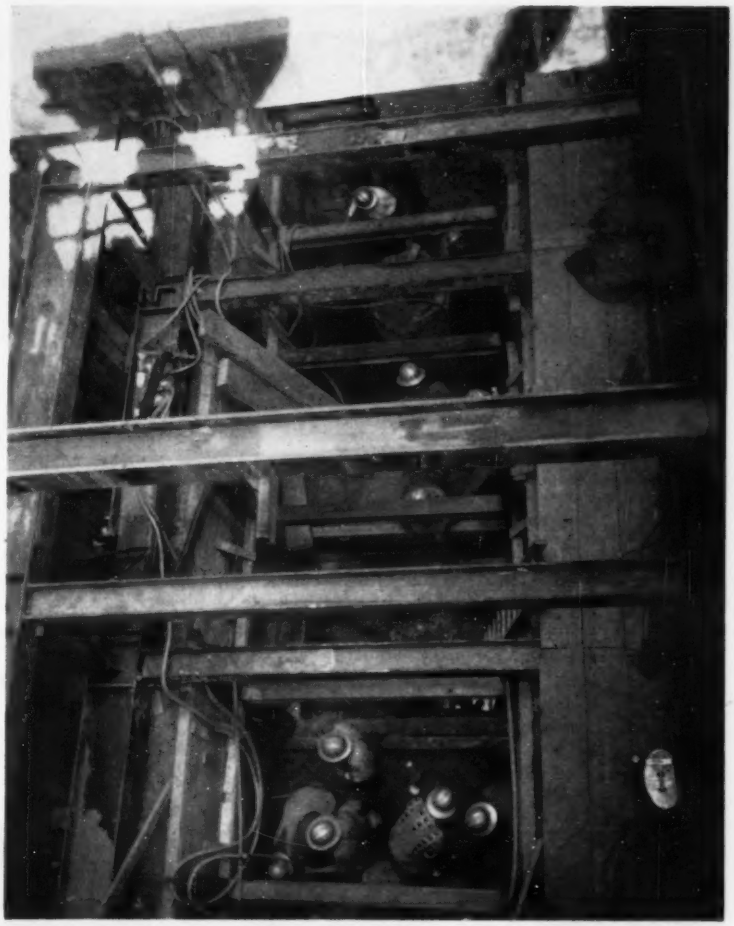
Blasting broke up the concrete foundation walls of the old Mutual Life Insurance Building in the center of the site. This structure was one of the first in the city founded on pneumatic caissons sunk to bedrock. The steel-encased concrete caissons required extensive demolition in the later stages of excavation, but at this point only the upper basement stories were removed. The basement structure provided a convenient location for the bank of compressors feeding air to pneumatic tools.

Protection of adjoining streets and nearby buildings was an important consideration in this stage of construction. As excavation cut down through the rubble, the contractor built a retaining wall around the site. Pile-driving rigs drove soldier beams at 5½-ft intervals. Timber breast-boarding then was inserted between the flanges of the beams as excavation proceeded. A berm at the foot of the wall provided further protection until raker beams had been placed to brace the walls.

Subways run under the streets along the two short sides of the 400x160-ft site. Heavy bracing and underpinning hold these structures against any damaging movement or settlement. The contractor makes frequent vibration tests to check on possible disturbance to nearby structures. No serious damage has so far been discovered.

Before the foundation wall trench could be dug down to bedrock, ground water flow from a wet sand and gravel intrusion on the eastern edge of the site had to be stopped. Chemical Soil Solidification Co. of Chicago handled this problem. They injected separate shots of sodium silicate and calcium chloride into the

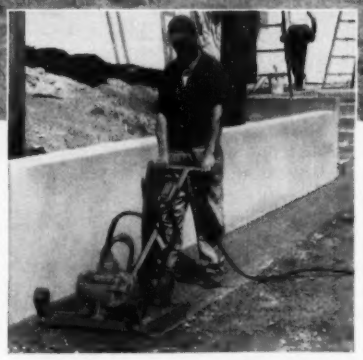
OPENING UP—Shovels and cranes with clamshells begin excavation of the 220,000 yd of material that must be dug out for the biggest hole ever dug in the Wall Street area.



IN THE TRENCH—Workmen with air-spades cut into dense hardpan within heavily braced perimeter trench to seat concrete foundation walls enclosing the site on bedrock.

Save MONEY, TIME and LABOR-

GALION 503 Grader with VIBRATORY COMPACTOR



GRADE AND COMPACT WITH SAME MACHINE!

This combination of 503 Grader and Jackson Vibratory Compactor does the work of two basic machines—thereby reducing equipment investment. There is no interference with ordinary grader operations such as spreading and leveling. However, the compactor is easily removed to permit full grader operations.

The vibratory compactor will accomplish most specified densities (including Proctor, Modified Proctor, and AASHO-T99-49) often in ONE pass.

With this combination you save . . . on equipment, labor, operating and overhead costs.

HIGH-SPEED MOBILITY—on the job and between jobs!

Compactor is easily raised or lowered by hydraulic power controlled from operator's platform. Permits the high speed of the grader to be utilized for maneuvering and dead-heading on the job and traveling between jobs. Saves time, permits more work to be done per day.

PROVIDES MULTI-PURPOSE USE!

Individual compactors may be detached and used as manually-guided, self-propelled compactors for confined areas inaccessible to multi-unit machines.

Compactor power unit can be used as a lighting plant or for operation of small power tools.

Write for literature.

THE GALION IRON WORKS & MFG. CO.

General and Export Offices • Galion, Ohio, U.S.A.

GALION ESTABLISHED 1907

MOTOR GRADERS & ROLLERS

For draglines, shovels, scrapers, bulldozers—you can't beat Tiger Brand Wire Rope for long, low-cost service

Changing the face of the nation's highways

with the help of USS Tiger Brand Wire Rope

On most of the big highway jobs, Tiger Brand Wire Rope is doing the heavy work. It supplies the steel "muscles" for shovels, draglines, scrapers and other earth-moving equipment.

Contractors are large users of Tiger Brand Wire Rope because this rugged steel rope lasts longer, moves more materials, and gets the job done quicker at less cost. Its Excellay Preformed construction makes it easy to handle . . . quick to install. It has less tendency to loop, kink or whip . . . and it offers highest resistance to bending fatigue.

Tiger Brand gives long, trouble-free service because it's made from the best possible steel. From ore to finished product, every step of production is rigidly controlled to guarantee top quality. And the rope is engineered to fit the job—engineered by one of the finest staffs in the country, and backed by the basic research of the United States Steel Corporation. Next time you need wire rope, rig up with Tiger Brand. It will keep your machines on the job. American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

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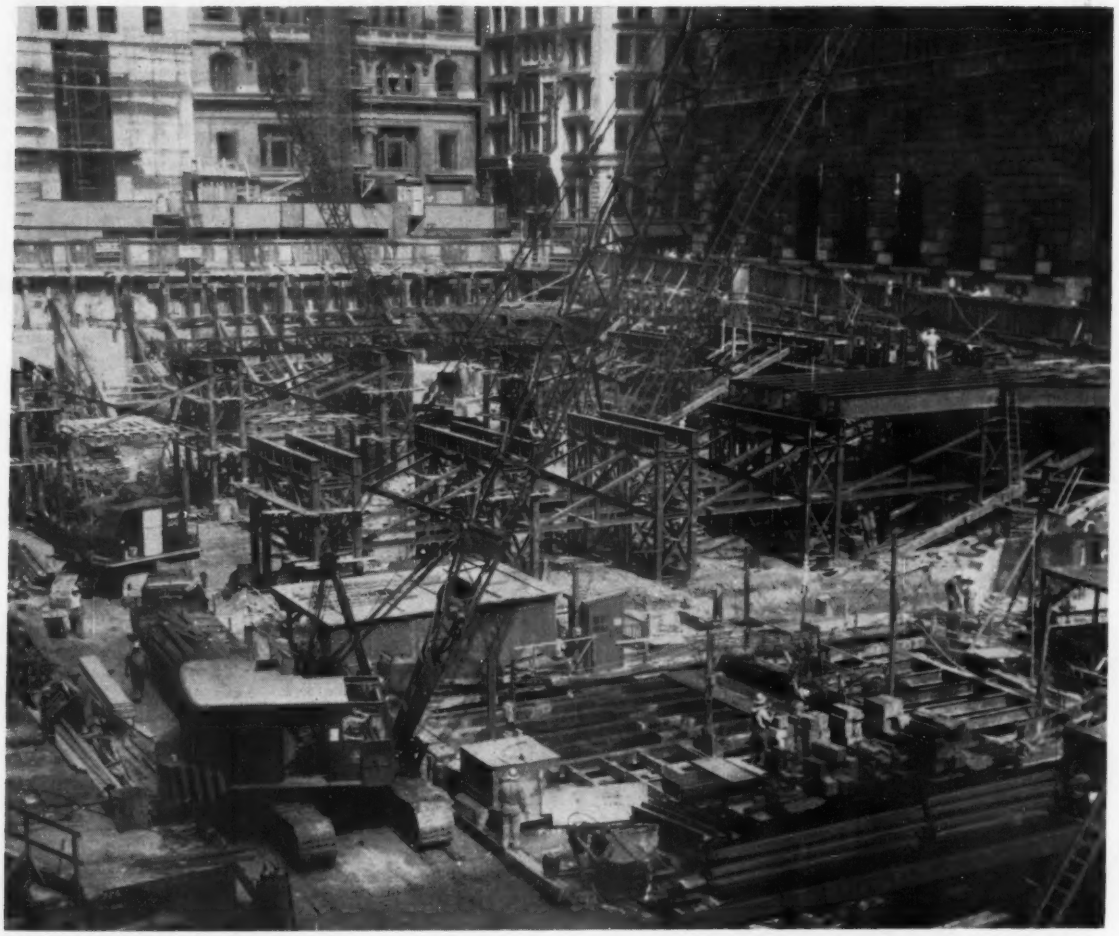


ERECTING A TRESTLE—Cranes place header beams across each row of four 10BP42 piles in the supporting bents and then erect the eight 36-in.-deep girders that span about 25 ft between bents. Three trestles provide access to the site at street level.

seam through pipes driven from site grade. The chemicals formed a solid sandstone dike that cut off the water-bearing layer (see CM&E, Sept., 1957, p. 95). Results were good; only a negligible amount of water seeped through into the trench when foundation wall excavation reached this level.

Wall Construction

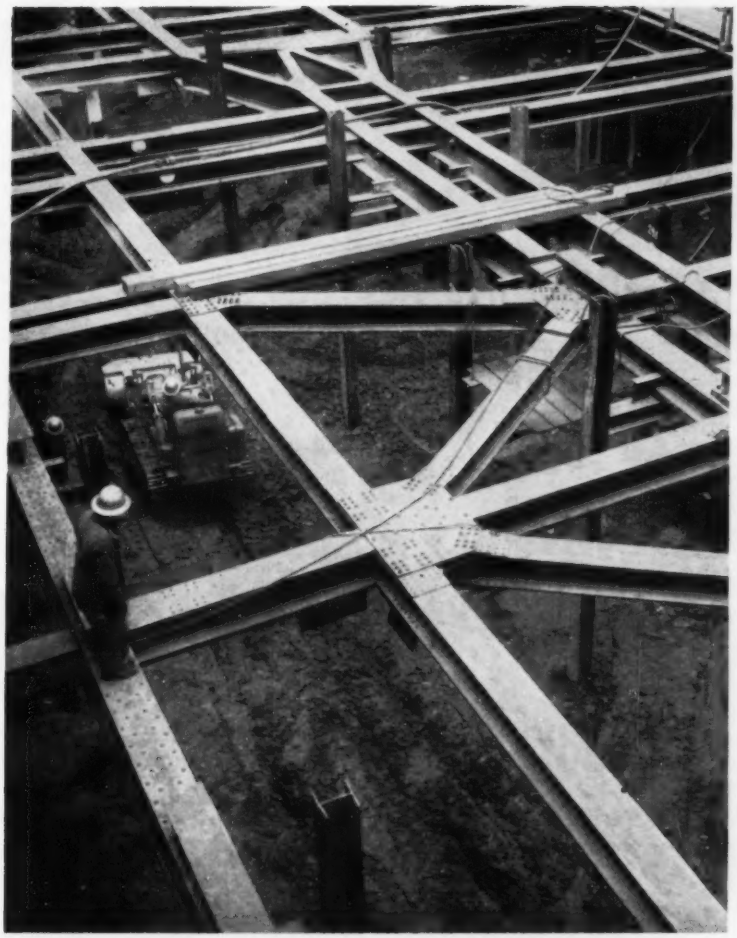
Because of the tough layer of hardpan that covers bedrock over most of the site, excavation down to rock for the foundation walls had to be carried out in two stages. First, pile-driving rigs drove a double row of steel sheet piling around the perimeter of the site. The trench varied in width from 13 to 16 ft, and transverse bulwarks about every 20 ft divided it into separate compartments.

Depth to hardpan varied over the site. Piling in the outside row driven from sidewalk level averaged about 60 ft in length; the inside row went down about 35 ft. Penetration in the dense hardpan was limited to 2 ft, even with hard driving by McKiernan-Terry 9B3 and 10B3 hammers. Altogether 1,360 pieces of interlocking sheet piling were used in the perimeter trench.

Cranes with clamshells excavated the material within the trench down to hardpan. It consisted mostly of wet red silt and sand. Heavy wales and cross-trench struts braced the sheet piling at three different levels as the excavation proceeded downward. As many as nine cranes drove piles and excavated the trench to keep this part of the job moving at a good clip.

In the second stage of foundation wall excavation, the contractor sank 8½-ft square shafts down through the hardpan to bedrock. First a row of shafts on 17-ft centers was cut out to a depth of 6 ft with air spades. Workmen placed 3-in.-thick timber sheeting between vertical steel wales as the shaft descended. Then the spades removed the block of material in between each pair of shafts. When the sheeting across the width of the cut was removed, the shafts became a continuous open trench. In this way, alternate shafts were sunk 6 ft at a time until they reached bedrock. At each successive step, steel struts were placed between the walers to reinforce the shafts.

When rock was exposed, quarry bars mounted at the bottom of the trench line-drilled along each side. The maximum depth cut into rock was 18 ft. This section was blasted in eight benches. Most of the wall was seated in sound rock at least 5 ft below the



TOP TIER—Tractor shovels cut below first level of cross-lot bracing system to make way for next level. Excavated material at this stage is easy-to-dig wet red silt and sand.

top surface of the sloping stratum.

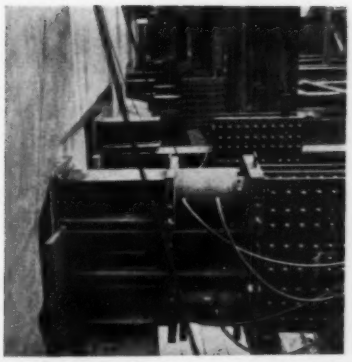
In the heavily braced trench, carpenters set forms for the inside of the wall. The steel sheet piling and timber sheeting in the outer row of the trench served as forms for the outside surface. Wall thickness in the bottom 65 ft varied from 5 to 7 ft; in the upper 20 ft, from 16 to 24 in.

Concrete crews placed the concrete from transit-mix trucks through a tremie system to reach the lower levels. Concrete lifts were 5 ft. In one day crews completed a section of wall 65 ft high that took 1,000 cu yd of concrete. Total yardage for the foundation walls was 14,000 cu yd.

On completion of the foundation walls enclosing the site, the contractor began placing cross-bracing and excavating within the block-square open pit. First, three steel trestles were erected to provide access to the site at street level. They jut out about 125 ft across the width of the pit from Liberty Street, the only available approach to the site. Eight 10BP42 steel piles form the supporting bents. A 24-in.-deep header beam connects each of the two rows of piles in each bent, and carries the eight 36-in.-deep girders that span about 25 ft between bents.

To support the cross-bracing members, the contractor drove additional bearing piles over the entire site. Beams connect the piles in pairs to provide a saddle for the bracing members to rest on. All supporting piles ended at the layer of dense hardpan about 45 ft below sidewalk level. Penetration in the dense material was limited to a few feet despite very hard driving. Final blow counts were as high as 100 blows per in.

A three-level stressed steel cross-bracing system shores the foundation walls as the material inside the walls is removed; it will become a permanent part of the basement structure as support for three of the six underground stories. Besides saving the time of removing a temporary bracing system, engineers figured that this plan would leave more work space inside the pit.



JACKING TEAM—Pair of hydraulic jacks at each end of member applies stress.

The layout of the bracing system is the same for all three levels. Fourteen 24WF160 beams with 14x½-in. cover plates cross the 160-ft width of the pit. Framing into these sections at right angles are six beams that parallel the 400-ft sides of the pit. These members are 14WF sections that vary in weight up to 426 lb per ft. The three levels are unevenly spaced vertically. The distance between the first level, which is about 20 ft below sidewalk level, and the second level is 13 ft; the third level is 21 ft below the second.

Cranes mounted on the steel trestles placed the cross-lot members of the first level on the supporting piles. Small bracket arms welded to the connecting beams between piles clamp the bottom flanges of the members to prevent excessive deflection under the jacking load.

Jacking

Four 300-ton Watson-Stillman hydraulic jacks—two at each end—stress each member. At each end, one jack rests on the top flange of the cross-lot member; the other is slung underneath against the bottom flange. The jacks react through heavy H-pile sections against 4-in.-thick steel bearing pads set into the foundation wall. A 1½-in.-thick push-

Ray Flowers, of Elyria, Ohio, hauls limestone in the Cleveland area. Last year he switched to an aluminum dump body, and extra profits started with the first trip. The extra profits, Mr. Flowers finds, add up to $15 per day.

He earns this bonus because aluminum reduces deadweight to let him carry 3,000 pounds of added payload for every trip. This payload bonus is worth $3.50, and he makes four trips per day. The rest is simple and profitable arithmetic.

But that's only part of Ray Flowers' profit picture. Aluminum defies corrosion and denting, and the elimination of upkeep saves him another $120 annually. Lower deadweight on return trips racks up savings of 15% on gas bills, besides reducing tire wear. To top it off, his aluminum body washes clean in half the time his old rig required.

LODESTAR CORPORATION, of Niles, Ohio, gave Ray Flowers these money-saving advantages by building his LODESTAR dump body of durable Alcoa® Aluminum alloy. For the names of other truck operators who are enjoying comparable benefits, plus your FREE copy of Alcoa literature, write Aluminum Company of America, 1879-D Alcoa Building, Pittsburgh 19, Pennsylvania.

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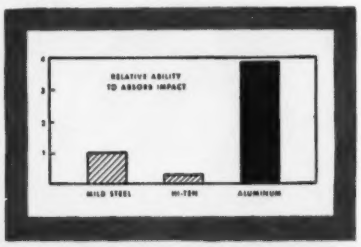

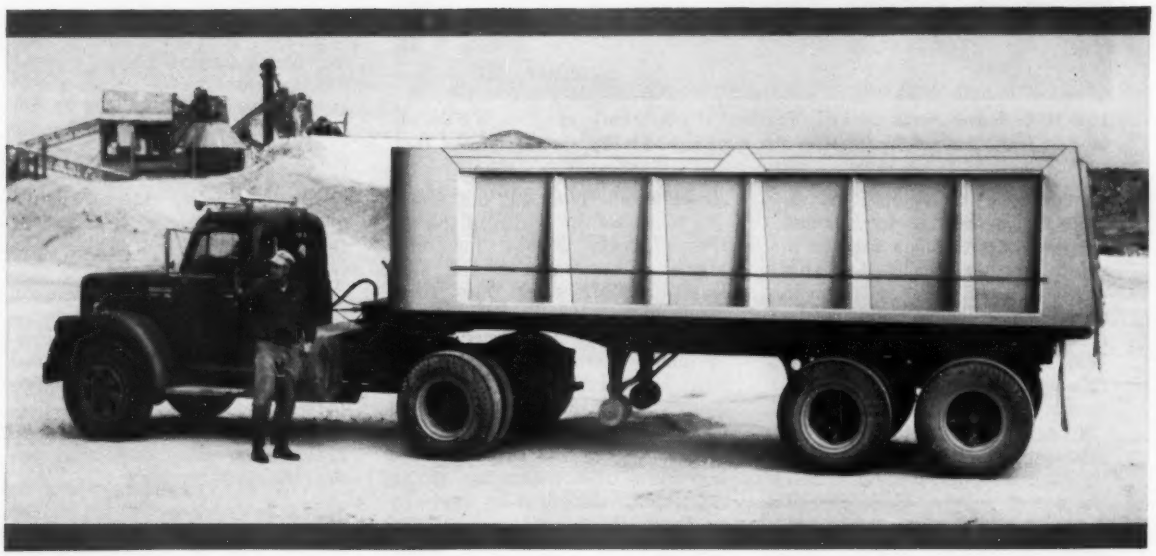

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PERMANENT BRACING SHORES OPEN-PIT FOUNDATION . . . continued

TOUGH DIGGING—Layer of very dense hardpan averaging about 35 ft thick stops piles cold; workmen extend piles ahead of excavation in holes dug out with jackhammers.

LOADERS KEEP BUSY—Caterpillar Traxcavators dodge through network of supporting piles to pile up material chipped out with jackhammers for removal by clamshells.

plate carries the thrust directly to heavily built-up diaphragm plates riveted to each side of the member.

The jacking operation is carried out in four stages. As the load shortens the beam, wedges between the bearing plate and the beam are tightened successively in each stage. The long cross-lot members are stressed first, and then the bracing across the width of the pit. A telephone hook-up synchronizes the jacking operation. Strain gage readings indicate stress conditions during the jacking cycle and provide a constant check on the effect of temperature conditions throughout the construction period. Jack pressure is adjusted as necessary to prevent either over-stressing during hot weather when the steel expands, or loss of stress in cold weather.

The anchorage assemblies are set in heavily reinforced pockets in the foundation walls. These recesses will later be filled with concrete flush to the inside surface of the wall. In one section where an old foundation wall was left in place, heavy 14WF398 sections reinforce the anchorages.

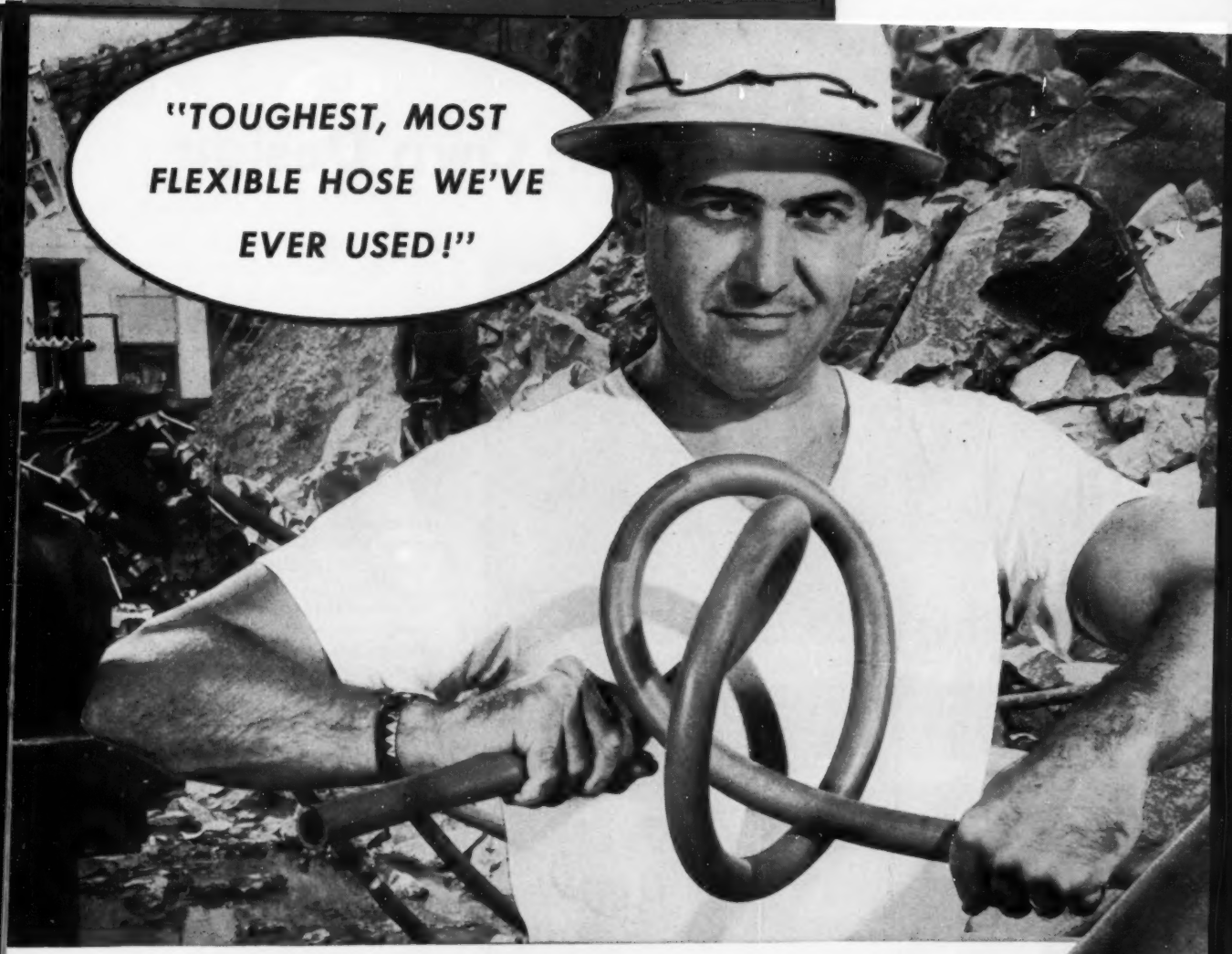
With the first level of the cross-lot bracing in place and stressed, the contractor began excavation to below the plan elevation of the second level of cross-lot bracing. The material in this layer was the same wet silt and sand encountered in the first stage of foundation wall excavation. A fleet of seven Caterpillar Traxcavators with 1½ and 2½-yd buckets cut the material out. This step carried the excavation down about 40 ft below street level to the layer of dense hardpan where the supporting piles end.

The second level of cross-lot bracing could then be placed in the same way as the first. When these two tiers are connected with temporary bracing, they form truss sections capable of spanning lengths up to 60 ft. So the supporting piles within each 60-ft span can be withdrawn and reseated deeper into the hardpan. Jackhammers dig out holes to extend the piles. The piles in the steel trestle bents are similarly withdrawn and reseated one at a time.

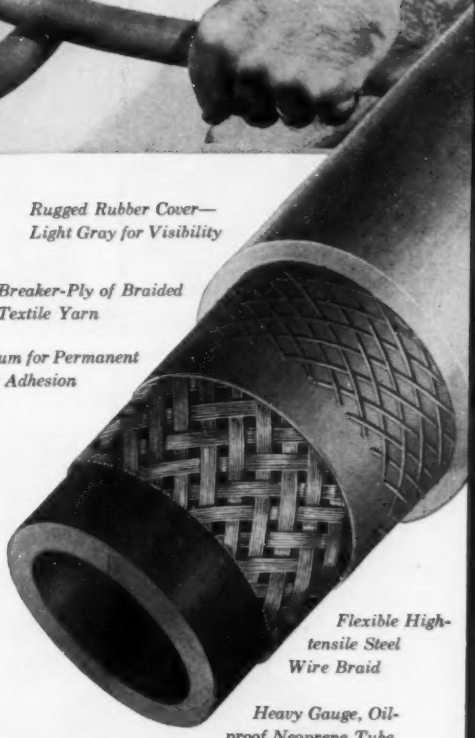
When all piles are reseated, excavation to below the third level can proceed in the hardpan. Work has reached this stage now. Crews with jackhammers are cutting down through the stubborn layer. In some of the less confined areas, blasting is helping to loosen the balky stuff. A wagon-mounted rig drills holes for the light charges.

The third cross-bracing tier is expected to be ready for stressing sometime this month. The entire three-level system will require 4,700 tons of structural steel. Two more re-posting cycles will be necessary to complete excavation, scheduled for early summer. Rock excavation totaling 22,000 cu yd will provide a level floor on the sloping bedrock. The basement floor slab, most of which will be 30 in. thick, will require placement of another 16,000 cu yd of concrete.

Foundation contractor is a joint venture of the Foundation Co., New York City; George M. Brewster & Son, Bogota, N.J.; and Joseph Miele Construction Co., Maplewood, N.J. Project manager is Lou Miller; general superintendent is Gene Fullam. In charge for the Chase Manhattan Bank is Andrew Fischer, Jr. Consulting engineers are Moran, Proctor, Mueser & Rutledge of New York City, with George Hammond as resident.



THUNDERBIRD
WIRE BRAID AIR HOSE



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Builder Scores with Own Design

TEMPORARY PIER—First step in building superstructure is to erect pier for falsework.

TEMPORARY TRUSSES—Four Bailey-type trusses carry wood forms for superstructure.

TEMPORARY SEAT—End of truss sits on removable steel beam cast into concrete pier.

A PHILADELPHIA CONTRACTOR has an unusual bridge contract. His assignment is to build the Gorgas Lane Bridge—and design it, too.

Conduit and Foundation Corp. took full advantage of the chance to design a bridge that would be easy to build, and they came up with a flock of cost-cutting ideas. As a result, they will finish the bridge well ahead of schedule, make a good profit themselves, and save the city of Philadelphia nearly $200,000.

With construction economy in mind they:

- Developed a poured-in-place, prestressed concrete design that is 20% cheaper than the steel superstructure planned by the city.
- Streamlined piers and beams to eliminate complex formwork.
- Made the superstructure monolithic so they could pour each 120-ft span (half-width), in a continuous 10-hr operation.
- Produced concrete that would not set during these 10 hr by adding Plastiment, a retarding agent.
- Chose simple spans rather than a continuous structure so that the forms could be re-used, and worked out a pouring schedule that keeps forms and crews in constant operation.

Double Bidding

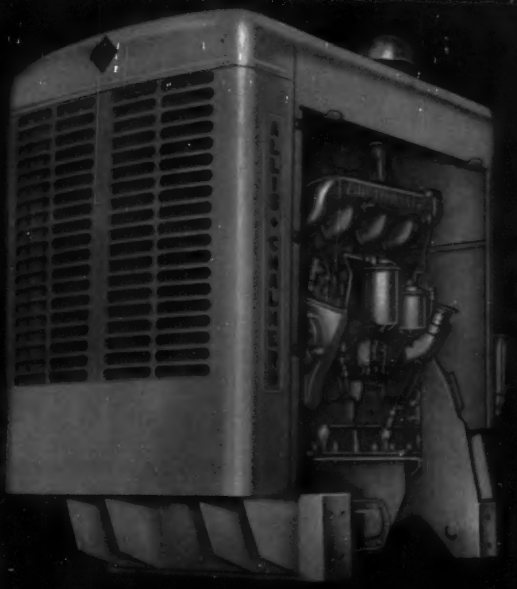
The city called for bids on its own design for a steel superstructure bridge, but it allowed contractors to submit alternate bids on their own designs. One reason for this was slow steel delivery. At the time of bidding, May, 1956, the city figured steel delivery time at 22-24 mo. Also the price of steel had risen since the original appropriation and Street Commissioner David N. Smallwood hoped that an alert contractor-designer combination, bidding competitively, might come up with a cheaper design.

Of the eight contractors who bid the job, three put in alternate designs. All three picked prestressed concrete. The alternate design had to have the same capacity, span lengths, and general specifications as the original.

One of the stipulations for alternate bidding was that the contractor hire a competent engineering firm to handle the design.

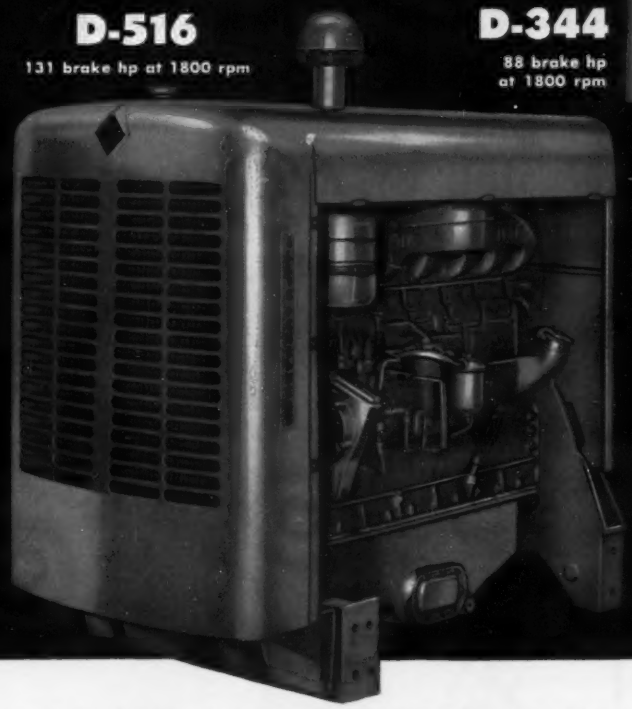
continued on page 181

2 new ALLIS-CHALMERS DIESELS



D-516
131 brake hp at 1800 rpm

D-344
88 brake hp at 1800 rpm



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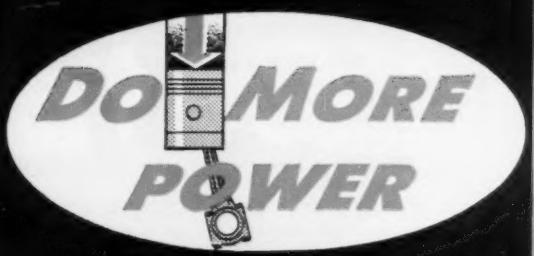

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These two completely new Allis-Chalmers diesels give you real *Do-More Power* — high-torque power that puts maximum turning effort on a shaft at the "bread and butter" speeds you actually use. They are smooth, steady, responsive to give you more profitable performance wherever you use them.

Follow-through combustion results in top fuel economy, lower operating costs.

BRIEF SPECIFICATIONS	D-344	D-516
Piston displacement, cu in	344	516
Bore and stroke	$4\frac{7}{16} \times 5\frac{7}{16}$	
Cylinders	4	6
Maximum bare engine horsepower (at 1800 rpm)	88	131
Power unit horsepower (at 1800 rpm)	79	122
Maximum torque at rpm	278 @ 1000	392 @ 1300
Fuel	No. 2 Comm. Diesel	
Types	Fan to flywheel engines Open or closed power units.	

Strength flows from end to end through husky, forged steel crankshaft.

Positively controlled cooling and lubricating works wonders with efficiency and engine life.

4-cycle simplicity fortifies your work-power, gives you more for your engine dollar.

Built-in safeguards provide protection, help assure dependable performance.

Ruggedness throughout means bonuses in long life, more operating hours per dollar.

Call your Allis-Chalmers engine dealer. Get the complete story on these and other Allis-Chalmers *Do-More Power* engines — 9 to 516 horsepower; operating on diesel fuel, gasoline, LP or natural gas.

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8C-13

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UNITIZED BATCHING PLANTS to further speed set-up and dismantling time . . . to give you even greater on-the-job flexibility. The new Heltzel Unitized Plant—like these on a G. Toccalino & Son job in Detroit—is designed in three easy-to-handle sections that go together in minutes. This installation is set up as push-button drive-through for extra fast service. Batcher and scale unit is integral part of center section . . . a real time-saving innovation. (Note new Heltzel E-4 twin-batcher cement plant.)

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FLEX-PLANE COMBINATION FINISHER-FLOAT does two jobs in one, reducing crew time to an absolute minimum. The combining of these two jobs is a natural—results in a better finish in faster time. This new machine was thoroughly tested on several jobs last season. Contractors report 4000 feet of 24-foot pavement was floated and finished in a normal day with but two or three hand finishers required. Get the facts on this profit maker before submitting too many quotations.

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Modern highway design demands top efficiency in highway construction machinery. Portable . . . versatile . . . automatic . . . *fast.*

That's why Heltzel Flex-Plane Engineering works to give you the most modern road-building equipment obtainable. Up-to-date engineering, for example, has produced a definite contractors' preference for Flex-Plane over all other makes. This preference is based, of course, on proved performance.

Find out now what Heltzel Flex-Plane Engineering can mean to you — call on actual users of Heltzel and Flex-Plane equipment, and prove to your own satisfaction that this is the *modern* equipment for modern highway construction.

COMPANY · Warren, Ohio

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The quality features of Super-Strong Nuts show up when maximum loads are applied. Quality-inspected bar steel and concentric tapped holes mean *strength*.

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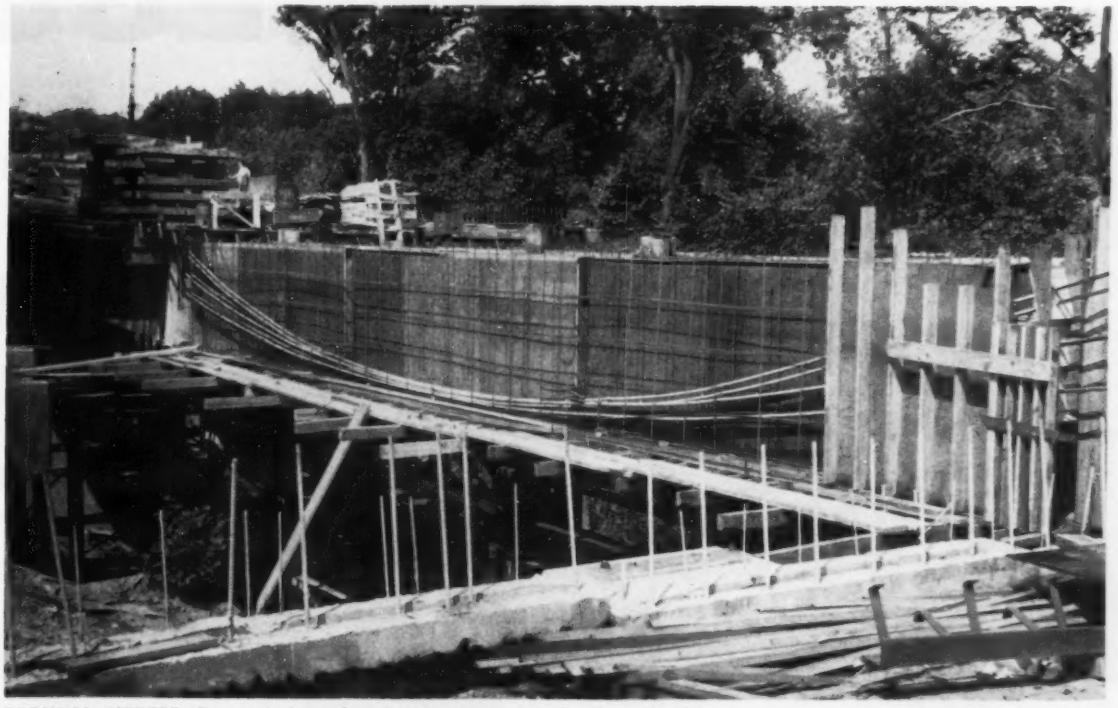

FORMING GIRDERS—Post-tensioning rods and reinforcing go in before last side of plywood form goes on. Girder lengths vary, so reinforcing is custom-made for each one.

C&F chose Preload Co., Inc., of New York. The combination won the contract to build a prestressed concrete bridge for $838,769. The lowest estimate for the steel structure was $1,023,440.

Design

The bridge is 750 ft long and 68 ft wide. The city wanted five center spans of 120 ft each with two end spans of 75 ft each. Preload considered making the bridge continuous over the piers but decided on a series of simple spans for purely construction reasons. With simple spans the contractor could build each span separately and get maximum re-use of his forms.

The designer also had a choice of main beams for the spans. The cross-section requiring the least material would have been a trapezoid or an inverted Tee with thin web and flange on the bottom. But these types require complicated forms. So, after consulting with the contractor, Preload chose a rectangular beam, 12 in. wide and 7 ft deep. This beam required more concrete to build, but the ease and speed of forming more than made up for the cost of the extra concrete.

POURING GIRDERS—Crews pour concrete into 12-in.-wide form through specially built trough. They build up the 7-ft-deep girders in 17-in. lifts, vibrating thoroughly.

Piers

The first move was to erect the six pairs of piers. C&F excavated 5 ft of soil and blasted out 10 ft of rock to reach a solid bearing level for the foundations.

They poured each of the piers in one lift except the four tallest ones which rise to over 80 ft. These took two lifts. The 4x12-ft piers have four straight sides, two of them battered. The straight sides simplified forming because all it took to change the height was a form section added or removed from the bottom.

Superstructure

Because the superstructure is monolithic, it would be possible to pour whole spans at once. But C&F figure they get maximum efficiency from their forms and

27 ton "EUC"

MODEL R-27

325 or 335 h.p. . . . Torqmatic Drive . . . 18.00 x 25 tires

Model R-27 is a new size in the complete line of Euclid Rear-Dumps—rated payload is 54,000 lbs. This off-highway hauler incorporates the job-proved components which have made Euclid Rear-Dumps the outstanding choice of contractors, mines and quarries.

With either 325 h.p. GM diesel or 335 Cummins engine, the Allison Torqmatic Drive makes maximum use of the power for faster hauling cycles. Converter lock-up in the 4-speed Torqmatic permits 34 mph speed with full payload and efficient performance on long, high speed hauls.

Standard 18.00 x 25 tires on all four wheels assure the traction and load carrying capacity needed for moving 27-ton payloads on tough hauls. Standard body is rated at 18 cu. yds. struck —quarry type body is also available. The R-27 is equipped with oil retarder for safer, more economical braking on jobs with steep down-grades on the loaded haul.

See your Euclid dealer for detailed specifications on this new 27-ton Rear-Dump . . . it's a good example of the advanced design that makes Euclid your best equipment investment.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

GM GENERAL MOTORS EUCLID

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FOR MOVING EARTH, ROCK, COAL AND ORE

REAR-DUMP

It's new...but JOB PROVED!

Big 18.00 x 25 tires on all wheels permit better distribution of payload. Rugged body and frame are designed to withstand loading, hauling and dumping big loads of heavy excavation year in and year out. Quarry body is available for rock work.

Low loading height and good maneuverability of the R-27 increase the efficiency of loading equipment. Exhaust heated body for work with wet, sticky material is optional. Front and rear springs are thrust-mounted and free floating, with variable spring centers.

The R-27 is equipped with dual steering jacks—one for each wheel—and an independent hydraulic system for steering. Oil retarder—an integral part of the Torqmatic Drive—permits faster safe travel speeds down grade and reduce brake maintenance cost.

Large capacity hydraulic pump and twin hoists have ample power to raise and dump the load fast. Mounting brackets for the two stage double acting hoists are an integral part of frame assembly. Comfortable, well insulated cab is offset for maximum visibility.

A COMPLETE LINE OF REAR-DUMPS—

10, 15, 18, 22, 27, 40 and 50 ton capacities, also semi-trailer models of 12, 22 and 35 ton payload—to fit any job

DECK POUR—Koehring crane with 1-yd Gar-Bro bucket hoists concrete from ready-mix trucks on ground to deck level. Concrete plant is 1-hr drive from site.

TRUCKS HELP—For end spans, ready-mix truck drives onto bridge to pour concrete for deck slab. Revibration welds slab to beams, making superstructure monolithic.

crews by pouring only half widths (34 ft) at a time.

The key factor in the 260-yd pours is the retarding agent, in this case, Plastiment, made by the Sika Chemical Co. Concrete without some retarding agent starts to set in less than an hour. That would not have been satisfactory for several reasons.

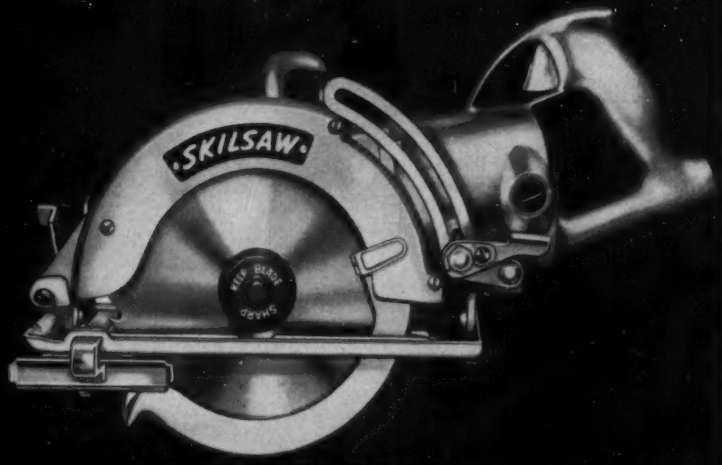
To start with, the central-mix plant is an hour's ride from the site. Also, the job started last summer when the temperature went up as high as 95 deg, and concrete sets much faster in hot weather. Finally, there is the complication of pouring for 10 hr. As the forms fill, the girders get heavier and gradually sag. This deflection would crack the bottom of the girders if the first lift of concrete were allowed to set too soon. So all the concrete has to be kept in a plastic state until the pour and deflection are complete.

A Koehring crane, stationed under the bridge, hoists the concrete 90 ft to the deck level in a 1-yd Gar-Bro bucket. The crane's 100-ft boom and 30-ft jib reach any point on the deck. When the spans reached the south abutment, 7½-cu yd, Rex and Yaeger concrete trucks started driving directly onto the bridge. This shortens the 10-hr pour by about 1 hr.

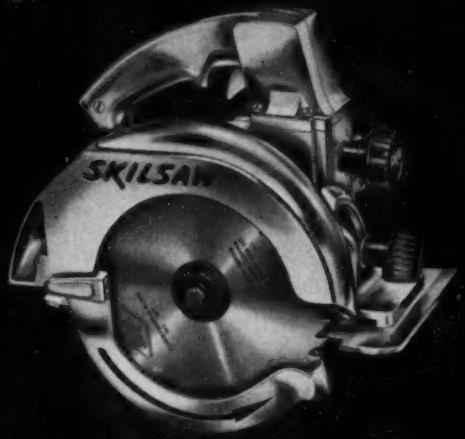
C&F built special wood troughs to funnel concrete into the narrow webs. The troughs are 3 ft wide, 8 ft long and have a 1-ft slot at the bottom. The concrete is placed in 17-in. lifts and compacted with 1½-in. Mall vibrators inserted every 30 in. for 20 sec.

It takes 5 hr to fill the four webs and four diaphragms. Before pouring the slab, the crews re-vibrate the beams to release trapped air bubbles and water. This causes the concrete to drop about 2 in., producing denser concrete and better bonding with the reinforcing steel.

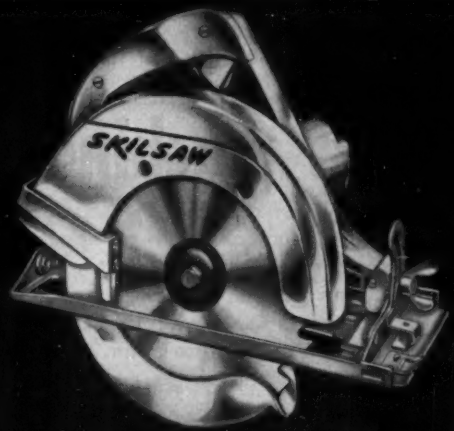
The 7½-in. deck slab is poured onto the beams immediately. The vibrators, inserted for the third and last time, weld the fresh deck



HI-TORQUE, super-duty SKILSAW—In-line rear handle and left-hand blade allows you to see line of cut. Exclusive hi-torque worm drive gives exceptional cutting power. Tough to stall anytime. Super duty saws with rear handle design come in eight models from 6½" to 12".



NEW HI-SPEED, super-duty SKILSAW—Completely new top-handle design for easy "swing-through" cuts. "Floating" blade guard and fast blade-change are exclusive new features. A total of 14 special features which add up to the most exciting new saw on the market today. Top-handle design available in 7¼" and 8¼" models.



ECONOMY MODEL, heavy-duty SKILSAW—Designed specifically for all-around use by carpenters or contractors in residential construction. Lightweight. Versatile. All heavy-duty models feature exclusive "Vari-Torque" clutch. Protects against blade kickback. Keeps motor in top running condition. There are five heavy-duty models with blade sizes from 4½" to 8¼".

WHICH SKIL SAW works best for you?

more proof of SKILMANSHIP*
ONLY SKIL MAKES ALL THREE

For more than 30 years SKIL has pioneered in the design of saws to meet the special needs of builders. Now, we offer the widest choice ever with the addition of a top-handle saw. Only from SKIL can you choose from three types. And remember this—no matter which model you buy, you always get the same superior performance that has made SKIL saw the favorite saw in the building field.

**SKILMANSHIP is the ability to offer the finest portable saws for over 30 years—saws that do any job better, faster, easier.*

SKIL

Made only by SKIL Corporation, manufacturer of famous SKIL and SKILSAW products, 5033 Elston Avenue, Chicago 30, Illinois. In Canada: 3601 Dundas Street West, Toronto 9, Ontario.

"A-W Super 99 is the best machine on the market" says Leo Russell, Russell Industries, Inc.

Russell Industries, Inc., Presto, Pa., asphalting contractor, specializes in building roads and parking lots. The company added another Austin-Western grader, a Super 99, to the team in June 1957—has three A-W graders now.

Leo Russell informs us: "We compared the new A-W Super 99 with other competitive graders and believe that it is the best machine on the market. It is excellent for leveling slag, does a faster job, and is easy to maintain. The all-wheel drive is an outstanding feature, and we also like the way you can grade curves without backtracking. Another thing that is very important is the fine service we get from our local A-W distributor. We've always been able to get good delivery on any parts we've needed."

Operator William H. Westfall says: "I've been operating graders for almost 30 years and consider the A-W Super 99 far superior to any other make. It's extremely maneu-

(Advertisement)

A-W Super 99 Grader, owned by Russell Industries, Inc., shown spreading slag on parking lot project in Irwin, Pa. William H. Westfall is the operator.

verable, and no other grader can match the traction you get with all-wheel drive. The A-W will do any job any other grader will do and do it quicker, besides being a lot easier on the operator. Hydraulic controls let you do a more precise job than mechanical controls, and you don't get the 'kicking' that tires you out. With the torque converter and standard transmission, you have perfect control downgrade as well as up. Another reason why I like the A-W is the way you can go from grading to back sloping or ditching without leaving your seat and making special adjustments."

Find out for yourself why the men who know graders best put their money on Austin-Western. Write for free illustrated booklet.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

CONTRACTOR DESIGNS BRIDGE . . .

continued

concrete to the diaphragm and webs to form a monolithic structure.

Chain finishing of the wet slab provides a rough surface for roadway bond. An asphalt tack coat placed on the slab the day after concreting serves the double purpose of curing the concrete and providing a bond for the asphalt road surfacing.

The post-tensioning of the 58 Stressteel bars starts seven days after pouring when the concrete reaches the required strength of 4,000 psi. Three men with 60-ton, Templeton-Kenly jacks stress the 1⅛-in. bars to 95,000 psi.

C&F worked out a smooth pouring schedule that keeps a small crew working steadily. They start with middle spans and work toward the abutments.

Four Bailey-type, re-usable steel trusses, one under each web, carry the forms for each span. A temporary steel bent tower supports the trusses in the middle, and the ends rest on temporary steel beams cast into the pier heads.

During the pour, the weight of the concrete deflects the forms. But the stressing lifts the concrete clear of the falsework so it is easy for the crane to pull out the trusses. The pouring schedule is arranged so that, in most cases, all the crane has to do is swing around and place the trusses under the next span.

A novel technique cut parapet forming time in half. C&F welded an outrigger frame to a stripped-down, 3-ton truck. Men riding on the outrigger screwed the outside forms to the floor slab. The outside forms carried 3-ft-high, angle-iron gallow frames that projected in over the deck and held the inside forms. Removable thru-rods held the forms at the proper distance apart. After the pour, crews on the outriggers removed the forms and patched the screw insert holes.

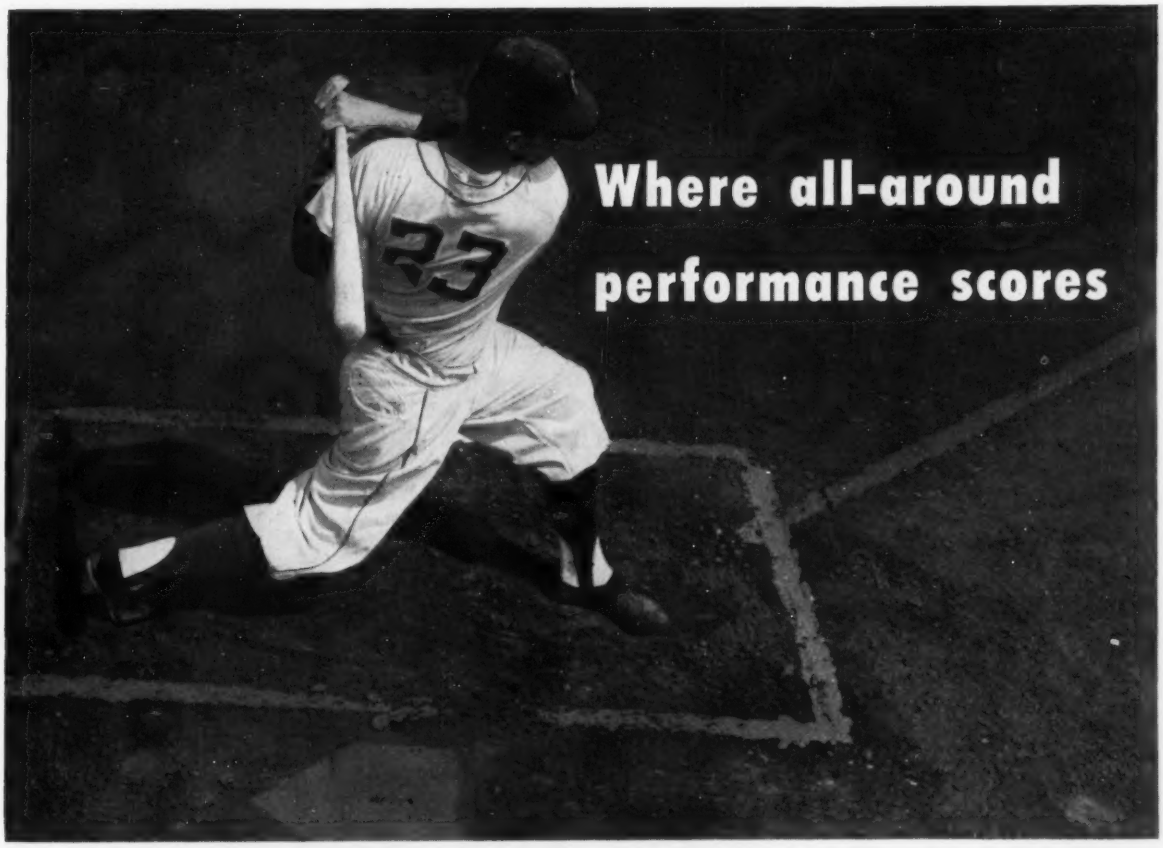
The main girders rest on concrete rockers, each with a 150-ton capacity. The rockers were cast 14 at a time with 5,000-psi, Plastiment concrete.

M. Schupack of Preload Co. designed the bridge, working closely with President H. R. Halloran and Superintendent Leo Fitzpatrick of the Conduit and Foundation Co.

OUTRIGGER—Steel outrigger frame welded to a stripped-down, 3-ton truck carries work platform. Men riding outrigger will bolt outside parapet wall forms to slab.

GALLOWS FRAMES—Outside parapet forms, placed by crews on outrigger, carry steel gallows frames extending over slab. Inside wall forms hang on rods from the frames.

ROCKER—Spans rest on concrete rockers, an unusual feature for a bridge of this size. Rockers are precast of 5,000-psi Plastiment concrete, can carry 150-ton load.



Permalube All-Purpose Grease #158 serves many purposes, proves best for chassis lubrication, universal joints, water pumps and wheel bearings.

Permalube All-Purpose Grease #158 is a highly water resistant, high melting point, lithium soap grease. It is a multi-purpose lubricant. It proves outstanding for chassis lubrication, universal joints, water pumps and wheel bearings.

This multi-use, high quality lubricant assists users in cutting down on the number of greases carried. Thus, with Permalube All-Purpose Grease #158 available, a single product does the job. It is not necessary to carry an inventory of separate lubricants for chassis lubrication, universal joints, water pumps and wheel bearings. Truly, Permalube All-Purpose #158 is a multi-purpose grease.

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Permalube Gear Oil
Perma-Flow Oils
Vesuvius "X" Gear Compounds

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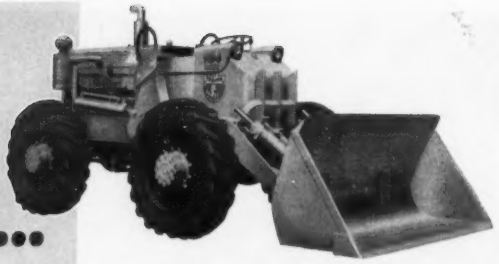
YALE & TOWNE

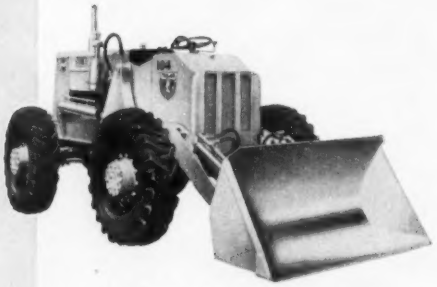
TROJAN TRACTOR SHOVELS

Any of these Trojan models can provide a king-size contribution in transforming your 1958 production picture . . . This is evidenced by the blistering sales pace set during 1957 . . . More prospects are discovering and more owners discovered that Trojan is the easiest handling tractor shovel they had ever operated — that Trojan meets all competition head-on by out-maneuvering, out-hauling and out-loading for a conclusive show of superiority . . . You eat-up stock-piles with straight line horizontal thrust, you get complete safety from reverse curve safety arms and correct power to weight balance for greater stability . . . Watch a Trojan work, then you'll know!



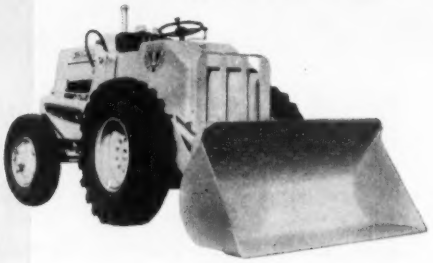
MODEL 154

2 cu. yd. cap., 4-wheel drive with Torqmatic transmission.



MODEL 104

1 ½ cu. yd. cap., 4-wheel drive with Torqmatic transmission.



MODEL LHM-75

1 ¼ cu. yd. cap., 2-wheel drive with torque converter.

MODEL 404

4 cu. yd. cap., 4-wheel drive with Torqmatic transmission.

By witnessing a competitive demonstration between Trojan and any other model of the same class, you will see beyond a doubt how Trojan's many 'plus' operating features enable it to outperform time after time . . . Ask for such a demonstration any place — at any time!

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2 & 4 Wheel Drive Front-End Loaders

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How Research Shapes Our Future Prosperity

If you are looking for an industry that is going to keep on booming in 1958 and every year for the next decade, here it is. It is the industry of technological innovation through research and development.

Last year this great new industry spent over $7 billion to discover and develop new industrial products, processes and equipment. This year the preliminary McGraw-Hill survey indicates that total expenditures for industrial research and development will be even greater, perhaps as much as $8 billion. Of the companies surveyed, 57% plan to spend as much as in 1957 and 38% plan to spend more.

The sustained expansion in research and development is the best guarantee we have that the current decline in business investment in new plants and equipment will be relatively short-lived. There can be no prolonged decline in investment in an economy where technology is changing rapidly.

This editorial is designed to show how the continued surge in research and development can be expected to lead first to new products, and eventually to renewed expansion of investment in new industrial plants and equipment. Such expansion is the essence of national economic growth.

A Slow Start

The impact of research on sales and investment is still very gradual. Research spending itself has more than doubled in the last four years. But only 32% of all manufacturing firms report significant capital outlays to make new products. We are not reaping the full dividends of industrial research as yet for several reasons:

- Research expenditures were relatively small until the Korean War of 1950 brought substantial government contracts in aviation, electronic and related fields. Heavy research outlays for civilian and industrial products came even later.

- There is an average *lag*, according to research directors consulted by the McGraw-Hill Department of Economics, of roughly seven years from the start of research until the product is ready for large scale output — about five years of research and at least two years to solve production problems and develop markets.

- Complex products, such as new consumer durables and industrial machinery, have an even longer time lag.

However, new developments are certainly underway. Research began to increase in all lines of business when Korean War restrictions and

the excess profits tax came to an end in 1953. The tax revision of 1954 added a new incentive by making research outlays deductible as a current business expense. By 1955, the research boom was on.

When Is The Payoff?

With a lag of about seven years, it will be the early 1960s before these new developments become a dominant factor in capital investment. But once the flow of new products and new processes starts, it will accelerate sharply — just as research spending has accelerated in the past few years.

By 1960, over $50 billion in sales will be coming from products not on the market as recently as 1956. Sales of new products will increase year by year, but they will gain most in 1960-1962, or five years after the recent spurt in research expenditures.

Capital expenditures to manufacture new products will also rise, but with a slightly longer lag. Here the sharpest rise should come in 1962-1965, as the new products reach a volume that calls for a significant amount of new capacity. In most cases, initial output of new products will come from existing capacity.

This timing of a new wave in capital investment appears logical on other grounds. Population experts forecast an upsurge in marriages and births around 1965. So by 1962, industry will be starting to tool up for new mass markets.

The important point is this: As we approach the 1960s more and more sales and investment will be in new products growing out of research. By 1960 well over 10% of manufacturing sales will be in new products not on the market in 1956.

Meanwhile — research will help stabilize capital spending by raising the level of modernization and replacement expenditures. Of course, research does not eliminate all the ups and downs in the demand for capital goods, for there remain variations in the amount spent to expand capacity. But a high level of modernization, to cut costs and improve quality, does put a floor under any drop in investment.

What To Expect

During the next few years we can expect an increasing flow of new materials, new metallic alloys, new machinery — primarily those developments coming out of long-established research programs in the chemical and electrical industries. Industry will make wider use of specialized computers and automated equipment.

But the dramatic payoff on research comes even later. In the early 1960s the consumer goods industries will begin tooling up for their really new products — things so basically new they can change the way a family lives. Such items as plastic houses, paper apparel, turbine autos are under development right now. But it will take several years to get costs down and for population and incomes to grow to the point where mass markets are created.

When we reach that point in the mid-1960s, there will begin the greatest surge of capital investment in all history. And then — around 1965 — the new processes (full automation, atomic power, continuous steel casting) which are the slowest and most expensive part of the research chain to develop, will come into play.

The combined impact of new products and new processes, to meet an expanding market, will thus be felt in the mid-1960s — eight to ten years after the recent sharp increase in research spending. The full impact is that far away because of the lags for applied research, pilot plant studies and market introduction. But to a large degree the prosperity of the 1960s has already been shaped by the research programs now underway.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw
PRESIDENT

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Ranger fork truck handles logs in 30,000 lb. bites

Clark's New Ranger®! Has guts . . . will travel!

The Clark *Ranger* pictured above is designed for the roughest, most rugged type of work possible. It's especially effective in the lumber, steel and construction industries. The *Ranger* handles 15-ton loads, goes where no other fork truck will go . . . works under conditions that normally bog down other equipment.

This *Ranger* was designed for the big jobs . . . but it's only one of over 90 standard models of materials handling equipment in the Clark line. Thus, no matter what your special requirements are, you can select a Clark truck to fit your job specifications *exactly*. Getting the right truck for the job means you save money on initial investment . . . you save money on operating costs.

It will pay you, and pay you well to examine the *complete line* of Clark equipment. For a personal copy of Clark's new condensed catalog, write: Complete Line, Clark Equipment Company, Battle Creek, Michigan.

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PERFECT CIRCLE PISTON RINGS

Construction Men in the News . . .

Pipe Line Contractors

R. P. GREGORY of the Houston Contracting Co. is the new president of the Pipe Line Contractors Association. He was elected at the association's annual convention at Boca Raton, Fla. Other new officers are: John H. Williams of Williams Brothers Co., first vice president; James W. Sharman of Sharman, Allen, Gay & Taylor, second vice president; and E. G. Morrison, of Western Pipe Line, Inc., treasurer.

Raymond Concrete Pile

COL. ROLAND C. BROWN, deputy division engineer of the North Central Army Engineer Division in Chicago, will leave the Army after 30 years' service to become associated with Raymond Concrete Pile Co.'s overseas construction.

Prior to an 18-mo tour as deputy division engineer, Brown served at the Engineer Center, Fort Belvoir, Va., and before that in the office of the joint Chiefs of Staff in Washington, D.C. He was assigned to the European theater during World War II.

Walter Kidde

G. T. SHANNON is a new director and CALVIN McCORMICK a new vice president of Walter Kidde Engineers Southwest, Inc., a division of Walter Kidde Constructors, Inc.

Shannon joined Kidde in 1953 as managing engineer of the parent company's industrial engineering department. In 1955 he became vice president and general manager of the company's southwest division.

McCormick came to the company in 1945 as a project coordinator. In 1956 he became director of sales and assistant general manager of the southwest division, positions he will continue to hold as vice president.

Twaits-Wittenberg

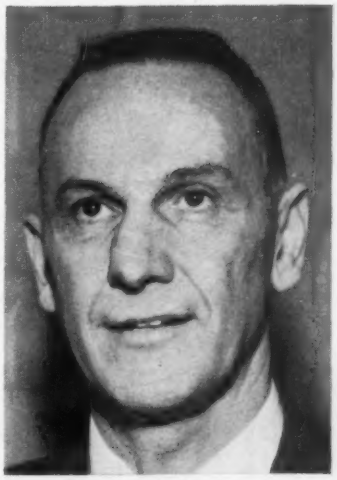
H. D. CARLSON is the new business manager of Twaits-Wittenberg Co., Southern California construction and engineering firm.

Carlson, in construction more than 36 years, joined T-W in 1940. He supervised construction of the $7-million Los Angeles Police Facilities Building, a $13-million Marine Corps training facility, and a $5.5 million missile testing base.

Fruin-Colnon

MARTIN F. LEONARD is new district manager of the Indiana Division of Fruin-Colnon Contracting Corp., St. Louis, Mo. He succeeds Aaron A. Pierson, vice president, who will head F-C's western division. Leonard formerly was construction supervisor in the company's Indianapolis office.

South California AGC



D. E. KELBEY is the new president of the Southern California Chapter of Associated General Contractors of America, largest of the 122 AGC chapters in the United States.

Kelbey presently is vice president and general manager of the Alex Robertson Co., Paramount, Calif., a company installing gas and oil transmission pipelines and other underground utilities.

Other officers elected with him are John L. Connolly of Connolly Pacific Co., R. H. Johnson of Del E. Webb Construction Co., and S. A. Wattson of R. A. Wattson Co., vice presidents; and J. P. Cagle of A. Teichert & Son, Inc., treasurer.

American Concrete Institute

DOUGLAS McHENRY, director of development for the Portland Cement Association, is the new president of the American Concrete Institute. He was elected to a one year term at the institute's 54th annual convention in Chicago. He succeeds Walter H. Price in the office.

McHenry became a member of the institute in 1936 while head of the structural research section of the Bureau of Reclamation's engineering laboratories. Prior to that he served six years with the Tennessee Valley Authority doing research studies of the structural behavior of TVA works.

Weight concentration in the lower center section eliminates top heaviness. Combined with 6 part block and tackle reeving, it gives OWEN Buckets that extra power to dig in at the beginning—and to continue to dig with equal force on both jaws during the entire closing cycle. At the end of the stroke, there is no power loss and lifting tendency is at a minimum.

Other features that make OWEN the leading clam-shell "seller" are:

One-piece Head Construction

Riveted Bowl Construction

Single Main Shaft

Recessed Lip Design

On this our 50th Anniversary Year, The Owen Bucket Company wishes to express our appreciation for the excellent acceptance of our products and pledges to maintain in the years ahead the high quality of design, workmanship and service that has become associated with OWEN Products.

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Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Schramm, Inc.: Briggs-Weaver Machinery Co. has been appointed dealer in the Dallas-Fort Worth area to handle sales, service and rental of portable and stationary air compressors, Schramm Pneumatractor and pneumatic construction equipment.

The Prime-Mover Co.: The following four distributors have been appointed: Cummings, McGowan & West, Inc. of St. Louis, Mo.; Flack Equipment Co. of Dayton, O.; Hawkins Equipment Co. of Memphis, Tenn.; and Highway Equipment and Supply Co. of Harrisburg, Pa.

Buck Equipment Corp.: The following seven distributors have been appointed: Central Supply & Equipment Co. of Danville, Ky.; Monty Machinery Co. of Great Falls, Mont.; Contractors Supply Corp. of Englewood, N. J.; Syracuse Ladder & Scaffolding Co. of Syracuse, N. Y.; Safway Scaffolds of Wichita Falls, Inc. of Wichita Falls, Tex.; Lund Machinery Co. of Salt Lake City, Utah; Wortham Machinery Co. of Casper, Wyo.

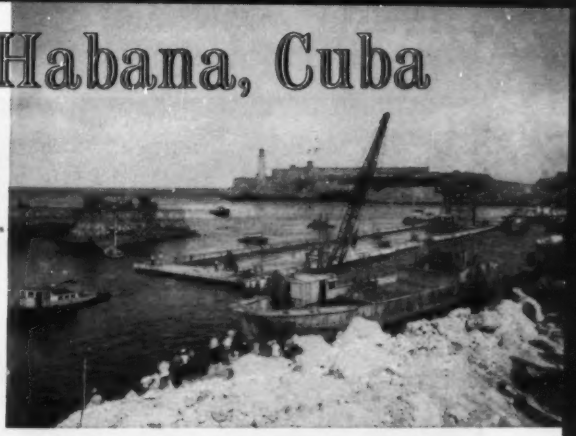
Diamond T Motor Car Co.: The following four distributors have been appointed: Labrucherie Truck Service of Stockton, Calif.; Shorty's Auto Supplies, Ltd. of Windsor, Ont., Can.; J. A. Fogelman Truck Sales and Service of East Chicago, Ind.; H & H Truck Sales, Inc. of Terre Haute, Ind.

H. K. Porter Co.: The Quaker Rubber Division has appointed two new distributors. They are: F. W. Heitmann Co. of Houston, Tex.; and Jess McNeel Machinery Corp. of San Antonio, Tex.

continued on page 199

Tunel de la Habana, Habana, Cuba

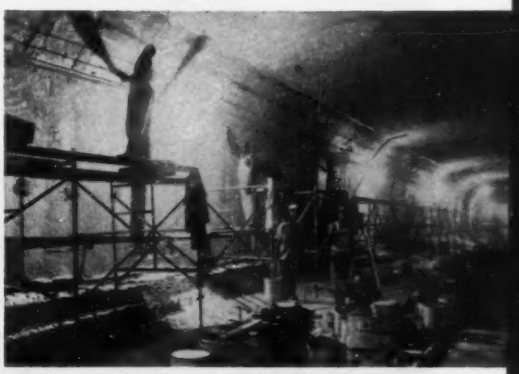
Remarkable engineering accomplishment, protected from water with the **Thoro System Products**



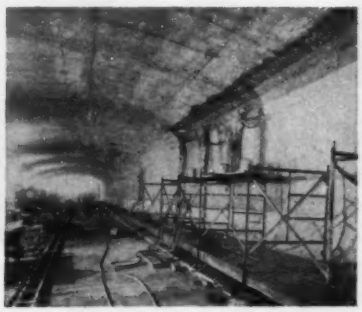
Four-lane, underwater tunnel, connecting Malecon Drive, City of Havana, Cuba with Guanabacoa near the famous Morro Castle, opening the sparsely-populated peninsula to residence and commercial activity.

Mammoth precast concrete sections are floated to location by attached pontoons, lowered 24 meters under water and connected to previously-sunken sections. ***Note the famous Morro Castle. Top, center background.***

Design, engineering and construction by Societe des Grand Travaux de Marseilles, Paris, France, 733 Meters Long, 23 Meters Wide, 7 Meters High, cost $28,500,000.00. Waterproofed inside and outside with THORO System products, THOROSEAL, WATERPLUG and THORITE.



From Havana side, tunnel entrance grades down to harbor pool level.



Thoro System Products applied, completes the job!

Preparing interior surface for WATERPLUG and one brush and one trowel coat of THOROSEAL. All walls, floors and ceilings are sealed with THOROSEAL.

Two double-lane tunnel sections take shape; forms will be filled with poststressed concrete.

THOROSEAL is being applied to all interior surfaces. Over 800 drums of WATERPLUG have already been used, where water was entering and where sections were joined together. All honeycomb and construction faults were sealed with THORITE Patching Mortar, before lowered to position in the bay.

Precast sections of tunnel, honeycomb patched with THORITE Patching Mortar and entire surface protected with THOROSEAL.

Thousands of drums of THOROSEAL, WATERPLUG and THORITE Patching Mortar are being used on this vast project.

Write for literature "HOW TO DO IT"

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For the first time, a scientific 16-mm. color movie is available to industrial explosives users to help explain the facts about vibrations from blasting.

The narrator is Dr. L. Don Leet, professor of geology at Harvard University and seismologist in charge of the university's seismograph station, and one of the world's foremost authorities on blasting vibrations. His scholarly but understandable approach to blasting vibrations convincingly demonstrates how the effect of a blast is often less than that of a passing truck, slamming a door, or just walking across a floor.

Perhaps this half-hour educational movie can help you in your community. Prints are available for showing to civic groups and other public gatherings. To borrow a print simply contact your nearest Hercules office.

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SALES & SERVICE...
continued

On the Sales Front

Yale & Towne Mfg. Co.: The Yale Materials Handling Division announces the following promotions: Louis W. Jander, assistant general sales manager; Gerald A. Tamblyn, sales manager, industrial tractor shovel line; Roy Perler, eastern regional sales manager; James Rainey, midwest regional sales manager; Neal J. Kemp, Detroit branch manager; and Philip R. Van Duyne Jr., New York branch manager.

Allis-Chalmers Mfg. Co.: The following promotions are announced: J. D. Harmison, sales manager material handling, Buda Division; N. A. Pohl, branch manager of the new Denver, Colo., branch of the construction machinery division; Robert N. Barr, sales representative in Des Moines, Ia.; James M Calder, sales representative in Detroit, Mich.

Symons Clamp & Mfg. Co.: Eric W. Plane has been appointed general sales manager. Herb L. Priest becomes northwest sales representative for concrete forms and forming hardware.

Erie Strayer Co.: William J. Jenkins is the new northeastern representative for the bucket division. He will make his headquarters in New York City.

Kelite Corp.: Vincent E. Bowes has been promoted to midwestern regional sales manager. The following two district sales managers have also been named: George S. Johnson, Indianapolis, Ind.; and Robert G. Hazel, Beaumont, Tex.

Garrett Corp.: Vice-president Frank Miles is now in charge of Sales Divisions for the company. He has named Grey Rider as manager of Airsupply, Jack Wright as manager of Aero Engineering, and Ian Rankin as manager of Garrett of Canada.

In the Main Office

Sika Chemical Corp.: Dr. Emil Schmid has been appointed president of the company. Dr. Schmid, educated in Switzerland, joined the company in 1934 and has been active in the development

Bennett Big "G" *double-action*

TRANSFER PUMPS

Deliver Steady, Reliable Fuel Transfer on Construction Jobs. Save Time, Money and Energy!

Corrosion and rust-proof working parts for long-life and dependable performance.

High vacuum, self-priming BIG "G" pumps require no foot valve—pump fluid on both forward and back strokes for a big saving in time and effort.

Fast pumping for gasoline, kerosene, fuel oils, motor oils, lubricating oils and other fluids from skid tanks and drums. Transfers 20 gallons a minute (based on 100 strokes).

Vacuum breakers provide complete hose drainage, prevent siphoning. Automotive type piston and ring design —engineered for easier operation and greater serviceability.

There's a BIG "G" model for every transfer operation. See how BIG "G" can save your time, money and energy.

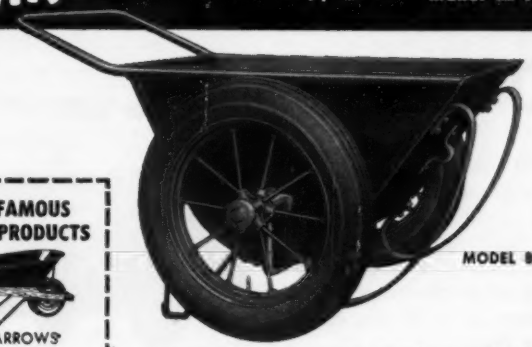
JOHN WOOD

JOHN WOOD COMPANY · Bennett Pump Division, Muskegon, Michigan

IN CANADA: JOHN WOOD COMPANY LIMITED • Toronto • Montreal • Winnipeg • Vancouver

CONCRETE CARTS by JACKSON TRADE MARK

Oldest and Largest Wheelbarrow Maker In America



MODEL B-88

OTHER FAMOUS JACKSON PRODUCTS

WHEELBARROWS

WHEELS

GAS SALAMANDERS

MIXING BOXES

MORTAR PANS

Rugged Jackson concrete carts have perfect balance and rocker runners for controlled dumping. *Won't roll back on operator.* Equipped with drop axles. Steel or pneumatic tired wheels with roller bearings and zerk fittings. Available in many models with 6, 8, or 10½ cu. ft. heaped capacity.

ASK YOUR CONTRACTOR EQUIPMENT DISTRIBUTOR

Jackson

Manufacturing Co. • Harrisburg, Pa.

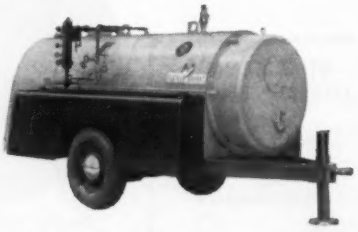
CLEAVER-BROOKS PORTABLE STEAMERS

125 HP 4300 lbs. of dry steam from a cold start in 30 minutes . . .

The PSM-125 maintains this pressure continuously . . . delivers steam on demand . . . in direct proportion to load. It puts more productive capacity into pile-driving hammers . . . has reserve capacity to match hammer sizes or heating requirements. Features one-control fire selector. All-weather protected. Fully fire-tested before delivery.

50 HP the huskiest multi-duty boiler in its range ever built

The PS-50 Cleaver-Brooks mobile steamer is the all-around machine you need . . . ideal for pile-driving, cleaning buildings, thawing culverts and dozens of other rugged jobs. You get quick steaming from a cold start . . . 1725 lbs. of dry steam per hour.



Cleaver-Brooks mobile steamers cost you less to run . . . get more work done . . . cost less to maintain. Famous four-pass, forced draft economy design produces high velocity gases that keep boiler flues clear of soot . . . minimize down time. Units are ASME code constructed . . . warranted to be free of defects in materials and workmanship. For complete details write:

Cleaver Brooks
COMPANY
Dept. C, 399 East Keefe Avenue, Milwaukee 12, Wisconsin
ROAD MACHINERY DIVISION

SALES & SERVICE . . .
continued

of concrete additives and prestressed concrete. Mr. Emil Spinden has been named vice president.

Rogers Bros. Corp.: Harrison Rogers has sold his stock holdings to the Rogers family and resigned from the company. He will be replaced as vice president and general manager by Edward W. Scarlett. Louis J. Rogers continues as president.

Special Mention

Four Wheel Drive Auto Co.: Controlling interest in the company has been purchased by Paradynamics Inc. of St. Louis, Mo. Frank Lyons, chairman of the FWD board, and five of the directors have resigned. George E. Mallinckrodt, president of Paradynamics, becomes the new board chairman with Lyons continuing as director. There were no other personnel changes.

Koehring Co.: The company's British affiliate, Newton Chambers and Co. Ltd., plans to merge with Ransomes and Rapier Ltd., one of England's oldest industrial concerns. The combined distributor organization should expand Koehring's sales potential in the sterling area and the larger manufacturing facilities of Ransomes and Rapier will allow the larger Koehring machines to be produced outside the United States.

Associations

Construction Industry Manufacturers Association: The CIMA has elected the following officers for 1958: Boyd S. Oberlink of Allis-Chalmers, president; G. A. Gilbertson of the Frank G. Hough Co., first vice president; Henry Barnhart of Baldwin-Lima-Hamilton, second vice president; Ray McLean of the Jaeger Company, treasurer.

American Standards Association: H. Thomas Hallowell, Jr., has been re-elected president for his third consecutive term. John R. Townsend was elected vice president. Vice Admiral George R. Hussey, Jr., USN (ret) was re-elected managing director and Cyril Ainsworth was named deputy managing director. T. E. Veltfort has been elected chairman of the Standards Council.

Maintenance Tips from Dino, the Sinclair Dinosaur

Rugged Oil for Rugged Duty

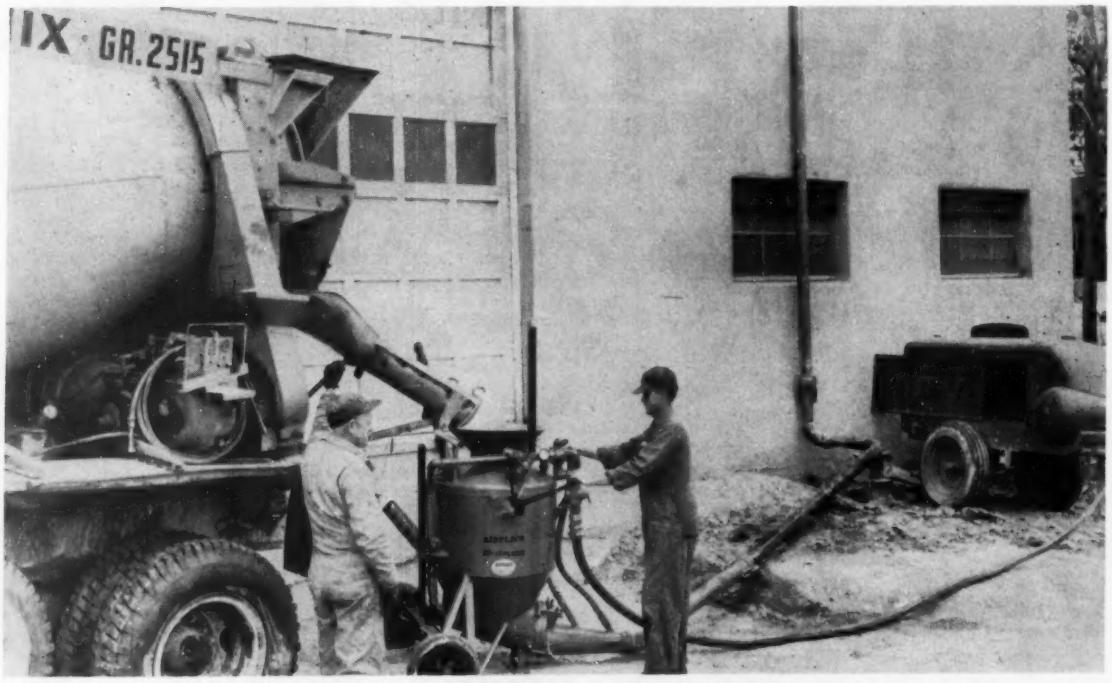
Tackling tough jobs and getting 'em done on time demands a lot from your equipment. Sinclair Super TENOL® Motor Oil will help keep your equipment working on the job longer – and more profitably for you.

This superior lubricant, a blend of high viscosity index base oils and selected additives, provides maximum protection against varnish, sludge, rust and acid corrosion. It guards your equipment against the rugged effects of high temperatures and continuous stop-and-go operation.

Refill now. There's a type of Sinclair TENOL Motor Oil to meet the requirements of your equipment. Contact your local Sinclair Representative for further information, or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Ave., New York 20, N. Y. *There's no obligation.*

SINCLAIR
SUPER TENOL®

Construction Equipment News...

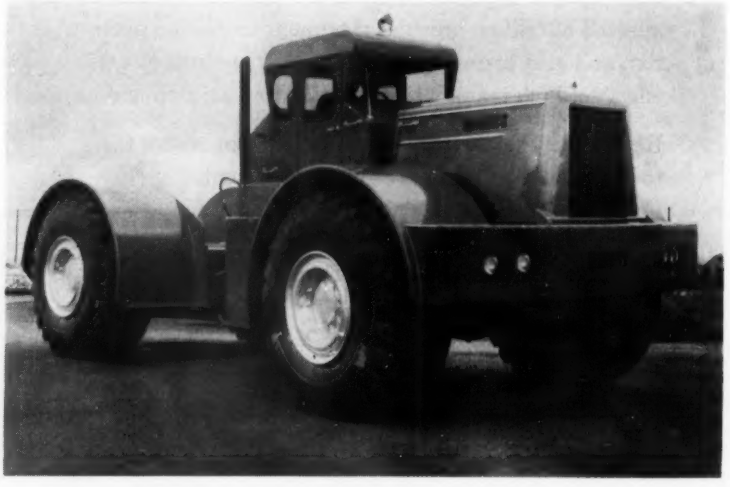


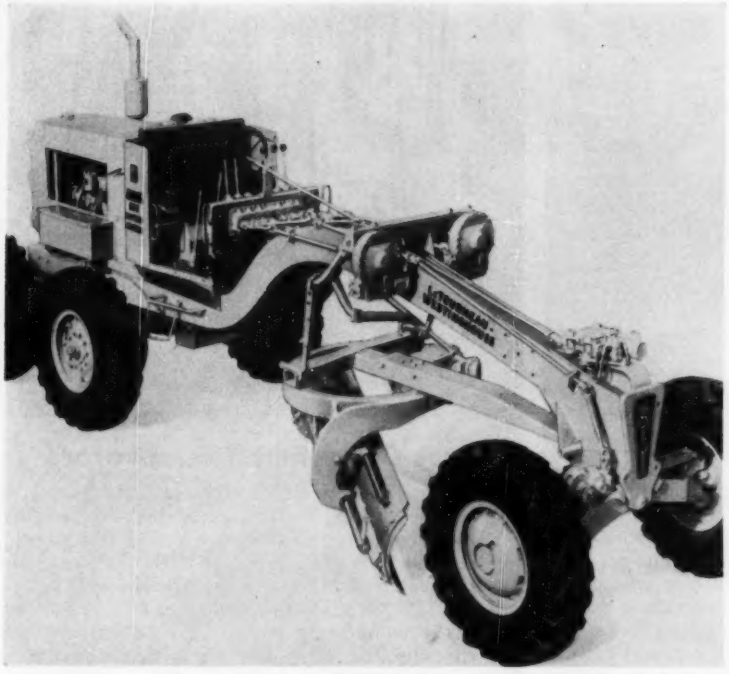
Airplaco's New Machine Uses Air to Place Structural Concrete

Air Placement Equipment Co. has come up with a new method of placing relatively small amounts of structural concrete. In the application pictured above, a 105-cfm air compressor was used to place a mix containing 1-in. rock through a 4-in. steel concrete placement tube. On this job, a 25-ft vertical lift was required and total pipe length to the discharge point was 150 ft. Additional vertical lift and greater lengths of placement tubing could have been used by increasing the air supply. The machine receiving material from the transit mix truck and transferring it into the pipe is Airplaco's new concrete placer. Two models are available: model CP-10 handles 10 cu ft per charge and model CP-15 handles 15 cu ft per change. Four or 6-in. tubing is available for use with either model. The concrete placers will place concrete with 2 to 6-in. slumps. Depending upon the slump, the length of placement tubing, the vertical lift, and the size of the air compressor, production ranges from 8 to 20 yd per hr, according to the manufacturer. For portability, the unit is mounted on tires.—**Air Placement Equipment Co., 1009 W. 24th St., Kansas City, Mo.**

New Tractor Features Standard Luxury

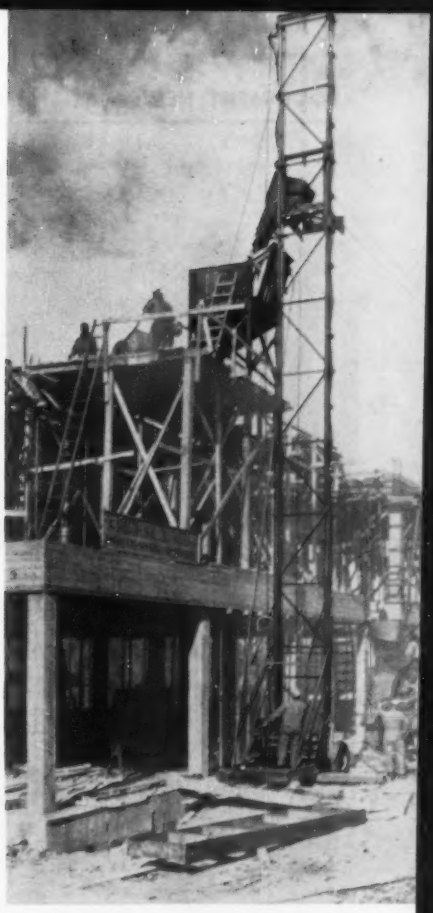
Standard equipment for Wagner's model 24 four-wheel-drive tractor includes an insulated cab with air conditioning, radio, and heater; automatic cut-off switches for oil pressure and water temperature; temperature gages for the transmission, transfer case, differential and engine; tachograph and clock; electrically positioned seat; air clutches and brakes; and a cigarette lighter. Other features include a 300-hp Cummins diesel engine, powered steering, planetary drive axles, and free oscillation of both axles. It weighs 35,000 lb.—**Wagner Tractor Co., Inc., Box 7444, Portland, Ore.**





Converter Smoothes Grader Operation

A torque-converter equipped model of the Adams 550 motor grader is the latest addition to the LeTourneau-Westinghouse line. The grader, called the Power-Flow 550, is the second torque converter-equipped unit in the Adams grader line. Providing a torque multiplication of 3-to-1, the 550 Power-Flow's transmission is a single-stage converter teamed with a four-range, constant-mesh gear box. This drive system provides the equivalent of an infinite number of gear ratios that adjust automatically to variations in the load. The grader has four forward speed ranges—.22 mph to 26.4 mph. Engine options for the Power-Flow 550 grader are Cummins NHC 4BI or GM 4-71, both rated at 135 hp.—**LeTourneau-Westinghouse Co., Peoria, Ill.**

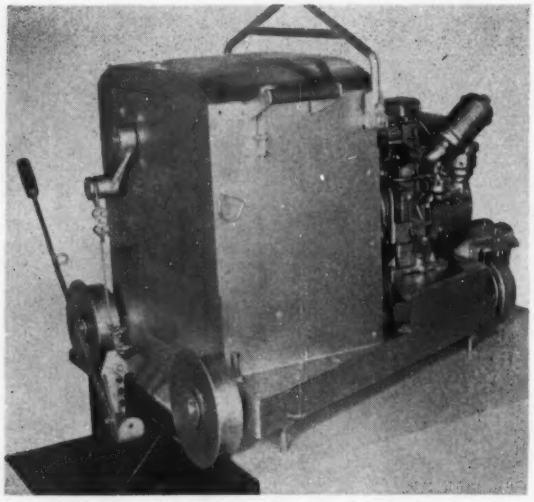


It Pours Concrete

Buck's portable hoisting machine is available with either 14 or 17-cu-ft self-pouring concrete buckets that can be set to dump at any pre-determined height. Called the Hoistower, the unit has a gasoline engine that lifts the bucket. The Hoistower is trailer-mounted and self-erecting up to 45-ft heights. Additional tower sections can be added.—**Buck Equipment Co., Cincinnati, Ohio.**

Cat Wheel Tractors Rated At 320 HP

The air induction system of Caterpillar's Super-Turbo engines—introduced on its DW20 and DW21 wheel tractors—is said to improve on the already high combustion efficiency of turbocharged engines. Because the induction system provides more accurate control of turbocharger speed, Super-Turbo engines operate efficiently regardless of changing loads. An after-cooler increases air density, and twin air cleaners and manifolds increase breathing. DW21 and DW20 engines have 320-hp ratings. — **Caterpillar Tractor Co., Peoria, Ill.** *continued on next page*



New Machine Pulls Form Pins

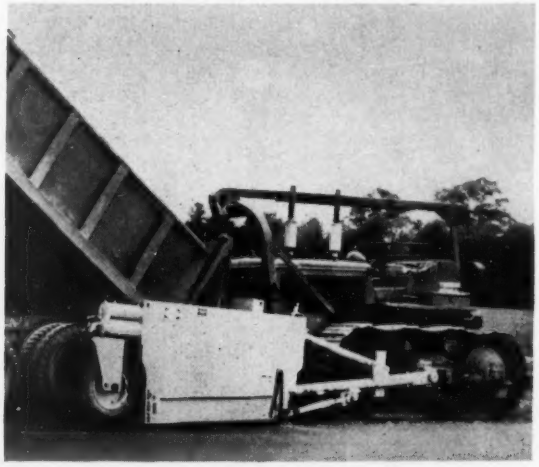
Cleveland Formgrader's automatic pin pulling machine might be the answer to a long-standing headache plaguing road contractors. Powered by a 3-hp engine, the machine pulls up to 1,500 pins an hr without damaging forms or concrete, according to the manufacturer. The 565-lb rig rides on three rubber-tired wheels from pin to pin. Its pulling action—up to 3,000 lb—assures that pins come out vertically and without bending. One man operates the machine.—**Cleveland Formgrader Co., Avon, Ohio.**

Engines Drive Small Generators

Homelite's two new lightweight and compact generators are driven by two-cycle gasoline engines coupled directly to the armature shafts. The generators are 60-cycle units rated at 3,000 w. The model 8A115 is rated at 115 v and the model 8A115/230 is rated at 115-230 v. Carrying handles enable the 140-lb units to be moved easily around the job to power electric tools, concrete vibrators, or floodlights. Both feature 4% voltage regulation and big overload capacity.—**Homelite, Port Chester, N.Y.**

Lima Adds 70-Ton Truck Crane

Lima's new 70-ton truck crane is available with 8x4 or 8x6 drive. The Lima-built carrier features T-1 steel in the main frame, easily removable "pin-on" front and rear outrigger boxes, hydraulic steering, and 14:00-24, 20-ply tires. All upper machinery functions are controlled by air. A powered telescopic gantry reduces travel height to 13 2/3 ft and a one-piece counterweight is removable for highway travel. Boom lengths up to 190 ft are available.—**Baldwin-Lima-Hamilton Corp., Lima, Ohio.**

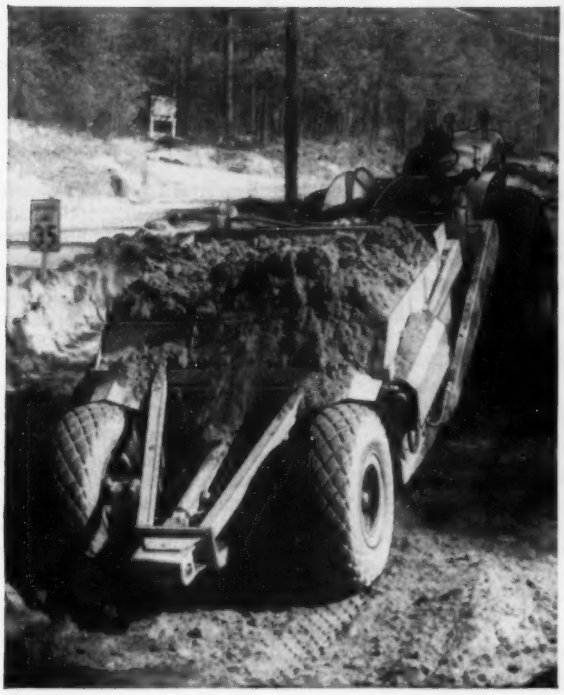


Crawler Carries Base Paver

Blaw-Knox's crawler-mounted base paver attachment spreads materials at rates up to 400 tph. Its oscillating screed, powered by an air cooled motor, controls depth, level, and crown. Screw-type controls vary the depth of spread from 1 to 20 in. and adjustable hopper wings give a maximum 16-ft spreading width. The 6,100-lb attachment is lifted completely off the ground by the crawler for travel.—**Blaw-Knox Co., Matoon, Ill.**

continued on page 208

OLIVER 990 SCRAPER



HAUL OFF... and DELIVER

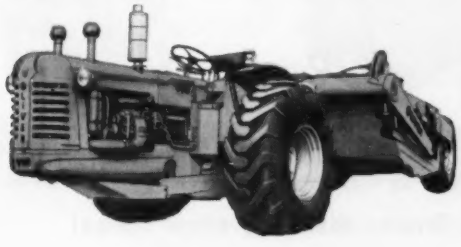
low-cost yardage on any size job

You can lick costs with the Oliver 990 because it's sized right for scores of dirt-moving assignments. Use it where larger, costlier scrapers are poor economy... and other types of equipment too slow. With 6.7-yd. heaped capacity, the 990 makes quick work of leveling subgrades, opening ditches, building shoulders, hauling and spreading—as the prime tool on small jobs or a "fill-in" rig on large projects.

100% hydraulic... fast cycle

Full hydraulic control gives it instant response to easy lever touches for operating bowl, apron and ejector. Positive hydraulic steering takes the muscle out of it... lets the operator work faster. Six-speed transmission meets every need for power and travel. High clearance means less grounding to slow down production. You get more pay loads at lower cost.

Here, at a modest investment, is the profitable rig for the large or small contractor... or the county department. The 990 is priced thousands of dollars below others. Call your nearby Oliver distributor for all the facts. Ask for free demonstration.



990 Scraper—6.7-yd. heaped capacity. Powered by the GM 106 h.p. diesel; available with 6-speed selective transmission or torque converter. Simple conversion to 4-wheel tractor unit makes it quickly available for use with other pull attachments. Write for Bulletin I-703.

OLIVER **THE OLIVER CORPORATION**

Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment

Now! The greatest concentration built into a truck engine!

Ford's all-new Super Duty V-8's—with displacements of 401, 477 and 534 cubic inches—are designed to handle GVW's up to 51,000 lb. and GCW's up to 75,000 lb. on America's toughest runs. And their endurance has been proved, not only in dynamometer labs and on the proving grounds, but in commercial fleets from coast to coast.

You get more miles with less downtime! These all-truck engines combine an entirely new concept of engine cooling with the latest developments in mechanical design and materials, setting new Ford standards of performance and dependability in heavy-duty truck service. Here is the "how and why" of Ford's superiority:

Exclusive three-stage cooling provides fast, uniform warm-up. Coolant flow is controlled by a second thermostat that balances the rate of warm-up and expansion of block and heads. Stress concentrations and the possibility of head warpage are virtually eliminated.

High-capacity water pump, the heart of Ford's cooling system, circulates over 200 gallons per minute. High volume coolant flow, with little or no aeration, supplies vital scrubbing action at valve guides and seats. Another advantage of this unique pump—its high capacity (50% more than competitive types) is obtained with no increase in required horsepower.

Water-jacketed fuel-air intake passages, in manifold *and* heads, maintain correct and uniform fuel temperatures from carburetor to combustion chambers. This results in proper vaporization and equal distribution of fuel-air mixture to each cylinder for improved economy and maximum engine smoothness.

New "In Block" combustion chambers transfer heat concentration from heads to block for 360° chamber cooling. This transfer allows better cooling of head and valve areas, greatly increasing the life of these parts. Combustion heat absorbed by the head of the aluminum alloy piston is transferred to the long, solid piston skirt. From there it is readily dissipated through the cylinder wall into the coolant which surrounds cylinder throughout the entire length of piston travel. The result is long life pistons and rings.

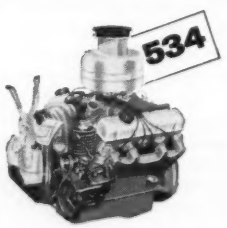
Internally mounted oil cooler keeps oil at lower temperatures for better lubrication. Reduced oil temperatures maintain greater oil film strength and reduce oil carbonization. Also, cooler oil means cooler running, longer lasting rod, main and camshaft bearings.

Fully machined combustion chambers mean close tolerances for accurate regulation of compression pressures. In Ford's new Super Duty V-8's, all surfaces of the combustion chamber (cylinder wall, bottom of head and top of piston) are precision-machined. Piston tops have a tapered step to maximize turbulence for improved combustion with regular grade gasoline. The smooth, straight surfaces of this wedge-shaped combustion chamber eliminate deposit-forming pockets to minimize harmful preignition.

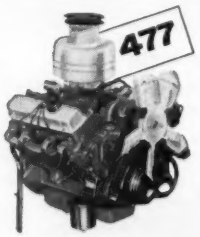
Turbulence Top pistons have four rings and three of them, including the oil ring, are chrome-faced for long life. The top ring groove has a bonded cast-iron insert to further reduce wear. Piston tops are extra thick to withstand high compression pressures. Each piston contains thermal struts that control expansion for a precise fit, hot or cold.

Hard-faced intake *and* exhaust valves with wear-resistant valve seat inserts are a Ford exclusive. Valves are made of heat-resistant materials and heads are dish-shaped to allow them to seat readily. To minimize the possibility of sticking, valve stems are electrolized, a surface treatment previously restricted to aircraft engines. Positive rotators provide a self-cleaning action for

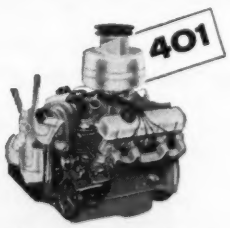
NOW!
Three all-new all-truck V-8's



277-hp Short Stroke V-8 . . .
Torque: 490 lbs-ft @ 1800-2300 rpm



260-hp Short Stroke V-8 . . .
Torque: 430 lbs-ft @ 1800-2300 rpm



226-hp Short Stroke V-8 . . .
Torque: 350 lbs-ft @ 1800-2300 rpm

American Business buys more Ford Trucks than any other make!

# of endurance features ever

They're all standard in Ford's new Super Duty V-8's

more perfect seating and sealing. Any valve material requires good cooling for long life. Ford's new Super Duty engine design makes more coolant available for lower valve temperatures. This coolant flowing past Ford's integral valve guides quickly carries away valve heat. In addition, exhaust valves are sodium-filled for rapid transfer of heat from head to stem. The sodium is added by a unique process that eliminates welding, thereby strengthening the valves.

Hot testing of every Super Duty V-8 is a typical example of Ford's quality control. Each engine is run for 20 minutes to check smoothness, timing, valve lash adjustment, oil pressure, and push rod rotation.

The engine is then partially disassembled. Parts are inspected for condition and alignment. Special attention is given to bearings and other items that might cause premature failure. The engine is then reassembled and run for about 10 minutes to check timing, noise level, acceleration, smoothness and coolant, oil or compression leaks. Only Ford uses such a detailed inspection of every engine. This is done to provide you with a more dependable truck.

New submerged electric fuel pump virtually eliminates vapor lock and maintenance problems. Mounted in the bottom of the tank, it pushes solid fuel under pressure from tank to carburetor. Its electric motor is sealed in a stainless steel capsule, and operates the pump by magnetic drive.

Every engine part is a truck engine part designed and built exclusively for Ford's all-new Extra Heavy Duty trucks. The same attention to detail required for durability in the major components has been carried over to all other parts as well. Listed below are but a few typical examples:

Stainless steel gaskets at heads and exhaust manifolds practically eliminate tie-ups due to blown gaskets.

No external oil lines to break. Oil filter and air compressor are mounted directly to block.

Valve stem seals are of same material developed for use in government missile program.

Rotor-type oil pump maintains high output, virtually unaffected by normal wear from extended operation.

Dual exhaust system provides far easier breathing and higher volumetric efficiency.

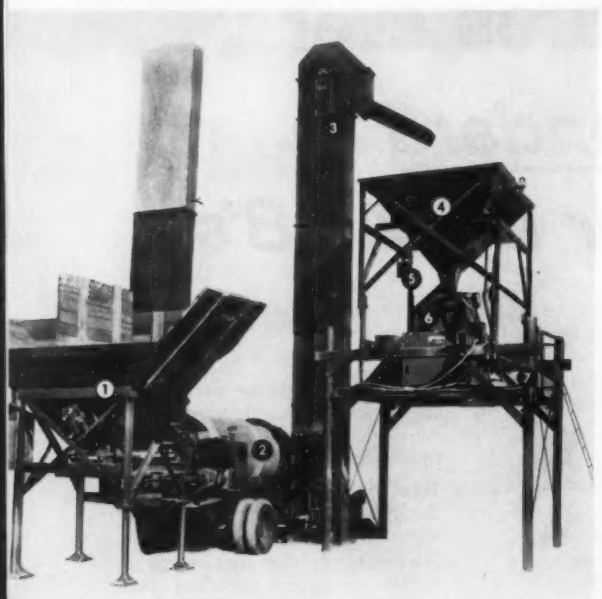
Alternator system replaces generator for longer electrical life.

Biggest Ford trucks ever built! Ten new series—Tilt Cabs, Conventionals, Tandems—up to 51,000-lb. GVW, 75,000-lb. GCW. For complete information see your local Authorized Ford Dealer.

Big truck built... big truck powered... at Ford's low prices!

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!

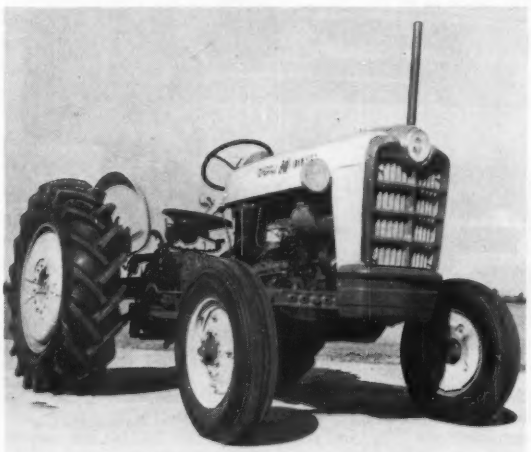


Compact Plant Turns Out 30 TPH

Littleford's new 30-tph asphalt plant consists of (1) five-ton dual bin; (2) 30-ton rotating dryer; (3) enclosed hot elevator; (4) five-ton storage hopper; (5) 1,000-lb batching hopper; (6) 1,100-lb twin-shaft pugmil that mixes and dumps a half-ton load in 60 sec; (7) and a self-elevating discharge platform. One man operates the portable plant.—**Littleford Bros., Inc., 453 E. Pearl St., Cincinnati, Ohio.**

Aluminum Increases Payloads

Anthony's new aluminum frameless dump trailers weigh considerably less than similar steel bodies, a factor that increases the payload for the 18-yd body pictured by 1,500 lb. To keep down weight, radius, suspension, and body frames, as well as wheels, are aluminum. Available body lengths for the single-hoist dump trailers range from 14 to 24 ft.—**Anthony Co., Streator, Ill.**



Ford Now Offers Diesel Power

A line of wheel tractors are the first American-built Ford products to use diesels. The line is powered by a 35-hp diesel with a 172 cu in. displacement. To keep costs down the diesel incorporates adapted components from a similar sized gasoline engine. The diesel, which cuts operating costs by 40 to 50%, fits gasoline-powered units without modification.—**Ford Motor Co., Birmingham, Mich.**

Side Boom For Hough Payloader

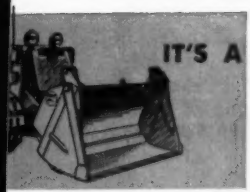
A side boom for its model HO Payloader has been developed for Hough by the Superior Equipment Co. The hydraulically controlled boom provides a maximum lifting capacity of 5½ tons and its length is adjustable in 2-ft increments from 10 to 16 ft. It does not interfere with the operation of the standard front-end bucket.—**Frank G. Hough Co., Libertyville, Ill.**

continued on page 210

4-machine utility in the large economy size

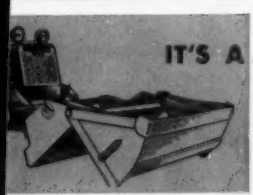
3-YD TD-18 4-in-1!

For your big contracts that are "jumping with jobs"



IT'S A . . . Skid-Shovel

. . . with exclusive pry-over-shoe break-out and ground-level roll-back.

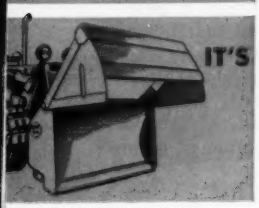


IT'S A . . . Clamshell

. . . that fills itself in one fast gulp—gives you hopper-high, self-clean-out dumping.

IT'S A . . . "Carry-type scraper"

. . . that grades, strips, or spreads with inch-close accuracy. "Boils" itself full!



IT'S A . . . Bulldozer

. . . with clam lip up and shoes on the ground, it's a big-yardage, earth-rolling blade!

Contractors are replacing the performance of a power shovel, bulldozer, clamshell, scraper, and "single-action" tractor loader—with one International Drott 4-In-1. The 4-In-1 strips and grades with accuracy, too!

The big 3-cu yd rig (shown) is the mass producer of the 4-In-1 line. It's sized to do an endless variety of big jobs on big contracts. It gives you king-sized 4-machine utility, for one moderate price!

From the bonus-powered TD-18's foam-cushioned seat, you just move the "machine selector" lever to position any of the four big-capacity 4-In-1 actions for instant use!

Add up the thousands of dollars a TD-18 4-In-1 can save you, in price and wages. Measure the huge, tough-job advantages of exclusive pry-over-shoe break-out action. See what it means to command the built-in performance protection of exclusive, shock-swallowing Hydro-Spring. See your International Drott distributor for a demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL HARVESTER

INTERNATIONAL®
DROTT®

When you need tools NOW!

PHONE the nearest Snap-on branch

Complete industrial wrench and hand tool service for

- Production
- Maintenance
- Field Service
- Original Equipment Sets

Albany, N. Y.	8-4056	Milwaukee, Wis.	WE 3-3116
Atlanta, Ga.	JA 4-8451	Minneapolis, Minn.	WE 9-7841
Baltimore, Md.	DI 2-4466	Newark, N. J.	ES 5-3197
Birmingham, Ala.	FA 2-8781	New Orleans (Metairie), La.	VE 5-3188
Boston, Mass.	ST 2-2230	New York, N. Y.	TU 2-6868
Brooklyn, N. Y.	HY 5-9595	Oakland, Calif.	HI 4-5986
Buffalo, N. Y.	GA 6374	Oklahoma City, Okla.	FO 5-3301
Butte, Mont.	2-8762	Omaha, Neb.	PL 3116
Charlotte, N. C.	FR 5-7704	Peoria, Ill.	5-2461
Chicago, Ill.	TA 9-2651	Philadelphia, Pa.	PO 5-7400
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Detroit, Mich.	TR 5-6455	St. Louis, Mo.	JE 1-2111
Fargo, N. D.	5-1381	Syracuse, N. Y.	9-7561
Harrisburg, Pa.	CE 2-6854	Toledo, Ohio	CH 3-1026
Honolulu, Hawaii	86-6665		
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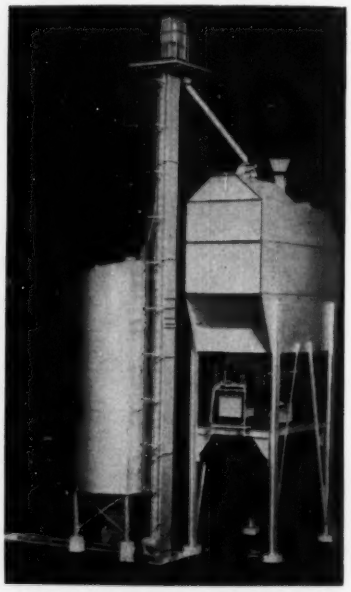
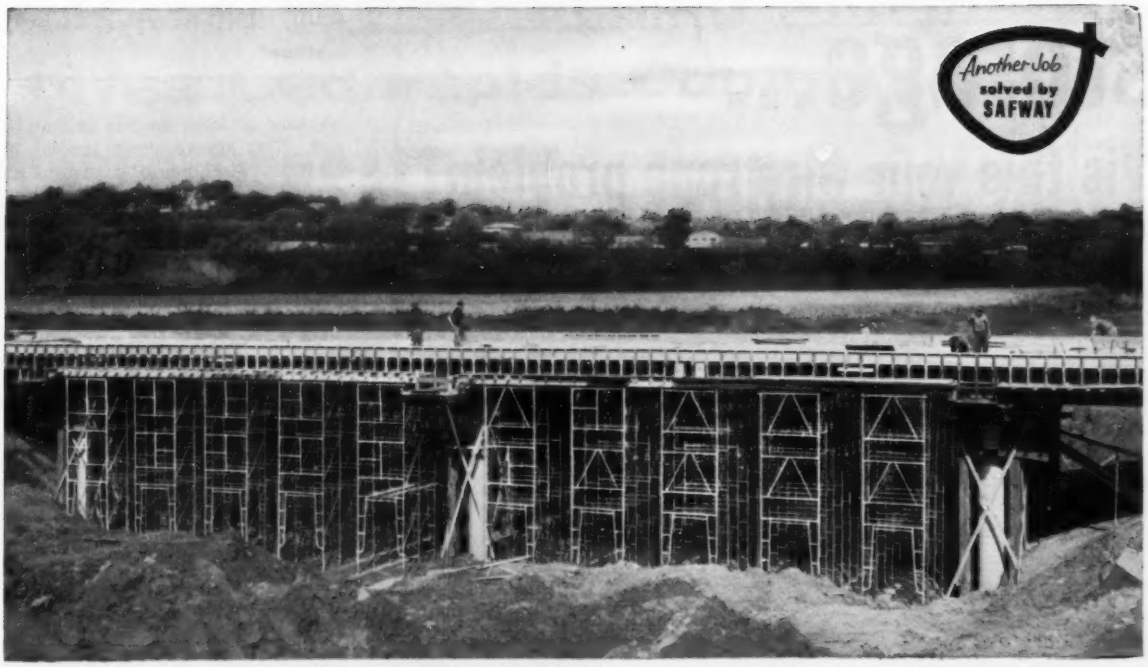
EQUIPMENT NEWS . . .

continued



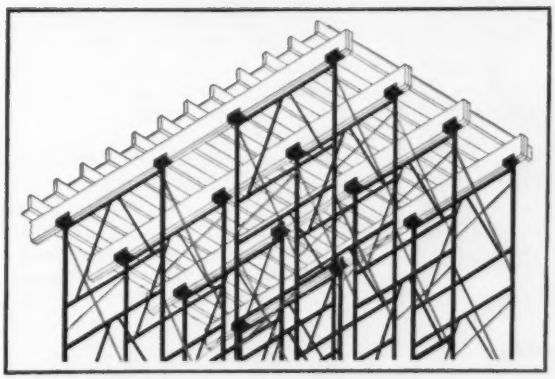
LOW ERECTION COSTS—Factory assembled batching and storage components cut down on erection costs for Blaw-Knox's new Uni-Rect truck mixer loading plant. The seven-part, 200-ton capacity plant includes a 3 yd automatic batching unit; four 37-ton self-cleaning aggregate compartments; two 300-bbl auxiliary cement compartments; and a cement elevator. A choice of manual, power assisted, or fully automatic batching systems is available for the compact plant. **—Blaw-Knox Co., 300 6th Ave., Pittsburgh, Pa.**

NEW EUC—A new 18-yd struck capacity rear dump truck has been added to the Euclid equipment line. Called the model R-27, the truck has a 27-ton payload rating. The Euclid truck is powered by either a 300-hp Detroit Diesel engine or a 335-hp Cummins engine. A four-speed Allison Troqmatic drive with an automatic converter lock-up to provide maximum economy when



Isabella St. Overpass on Relocated U.S. Highway 77 at Sioux City, Iowa—38' 6" Wide and 48' 6" Long Between Bents

Scaffold Shoring Speeds Bridge Job



How the Scaffold Shoring Was Figured

The number and spacing of the scaffold towers were determined from the weight and height of the bridge deck and the capacity of the wood falsework. With 335 lbs. per sq. ft. of working load, leg spacings of the scaffold towers were set so that each leg could work as close as possible to safe capacity.

Frames in the same plane were set 3' 9" apart. In the other direction, frames were connected with 3' long pivoted steel cross braces. Thus, each of the 300 steel scaffold legs supported over 12 sq. ft. or 4,400 lbs. at a height of 19' 6"—safely, conveniently and economically.

Write FOR FREE CATALOG

Learn all about the advantages of shoring with Safway steel frame scaffolding. Write today for your copy of **BULLETIN 184.**

SETTING AND STRIKING TIME CUT 10.4% BY HOBE ENGINEERING WITH SAFWAY SCAFFOLDING

ROAD AND BRIDGE contractors saw a demonstration of how to save by shoring with Safway steel frame scaffolding on this superhighway bridge job.

Twin 173' spans were successfully completed by the Hobe Engineering Co. of Sioux City, Iowa. Using Safway shoring equipment for the first time, the contractor saved 10.4% over old methods in erection and dismantling time alone, despite adverse weather.

Without tools, standard Safway frames were quickly assembled to fit all job conditions. Towers were spaced to carry an average of 4,400 lbs. on each 19' 6" high scaffold leg. Screw jacks compensated for uneven ground. When the first span was completed, the same shoring equipment was re-used on the opposite roadway.

In spite of bad weather and unfamiliarity with the method, the ease of Safway shoring assembly produced this important saving for Hobe Engineering the very first time on the job.

CONSULT WITH SAFWAY—You, too, can work better—make better profits with Safway scaffolding and shoring equipment. Your nearby Safway dealer maintains ample stocks for SALE or RENTAL, and will help you with planning and erection service. Call him on your next job!

SAFWAY®
STEEL PRODUCTS, INC.
6243 W. State St., Milwaukee 13, Wis.

storage...

is this your wire rope problem?

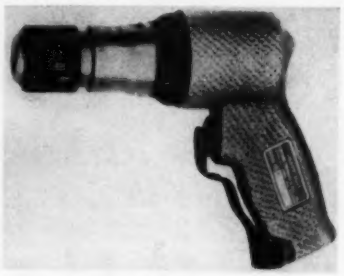
Avoid deterioration while equipment is idle. Red-Strand Bulletin No. 103 tells how.

Costly damage can be the penalty for improper outdoor storage of wire rope especially in winter. Several months of exposure can corrode rope so severely that breaking-strength is dangerously reduced with a loss much greater than the cost of adequate protection. How best to provide that protection is clearly explained in special Service Bulletin No. 103. This is one of a series, devised to help wire rope users get better performance without greater cost. Copies of bulletins are sent free on request. Write H. K. Porter Company, Inc.—Leschen Wire Rope Division, St. Louis 12, Mo.

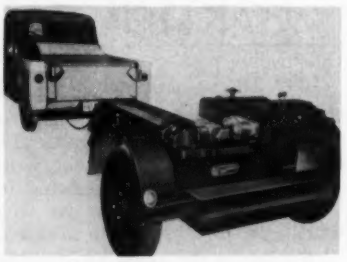
LESCHEN
Red-Strand
WIRE ROPE

H. K. PORTER COMPANY, INC.
LESCHEN WIRE ROPE DIVISION

hauling at high speeds is standard. Top speed when loaded is 34 mph. A choice of standard or quarry type-body is available. The standard all-welded body is raised by twin, double-acting, two-stage Euclid hoists. Designed to work with big loading equipment, the R-27 has a loading height of 9 ft 10½ in. and a dumping angle of 61 deg. Standard tires are 18.00-25 on all wheels.—**Euclid Div., General Motors Corp., Cleveland 17, Ohio.**



STUB NOSED—Superior's new air hammer features a short barrel that makes it easier to work in blind spots or in close quarters. The model SP-600 weighs 3 lb and is only 8 in. long. It has a metering trigger that lets the operator control blows from 0 to 3,500 per min with one finger. A patented safety chuck locks tools in six different positions. Air consumption is only 11 cfm at 90 psi. The hammer sells for $109.50 with one chisel.—**Superior Pneumatic & Mfg., Inc., 4758 Warner Rd., Cleveland 25, Ohio.**



PORTABLE PRESS—A trailer-mounted model of its new Trackmaster hydraulic crawler track press has been announced by Owatonna Tool Co. Like the stationary unit, the trailer-mounted Trackmaster uses a 125-ton ram to push both pins and bushings simultaneously without broaching, shearing, or otherwise damaging sidelinks. The portable press is easily hauled by a light

New Pre-Screening Attachment gives Cedarapids Commander

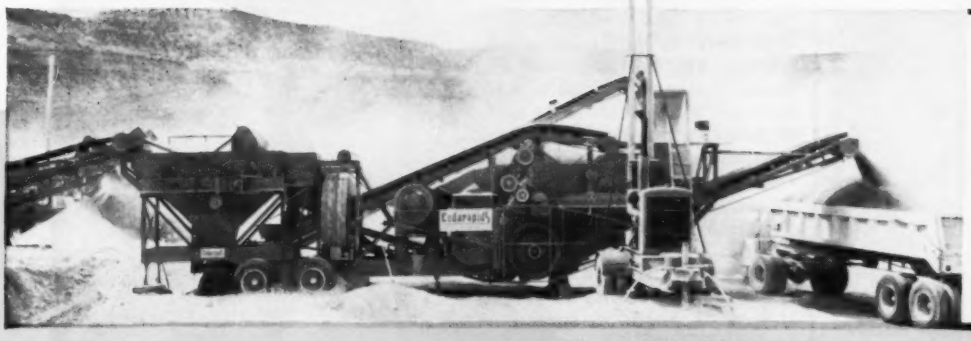
GREATER VERSATILITY...HIGHER CAPACITY

358N

Now your Cedarapids Commander—the next one you buy or the one you have on the job—can be equipped to remove fines from the circulating load and give you additional flexibility in meeting specifications calling for high percentages of crush while maintaining the plant's normal high capacity.

The secret is the new Cedarapids Pre-Screening Attachment. It's the most efficient accessory available to make the operation of a single portable tandem plant not only economically practical, *but profitable*, where the finished product must be up to 100% crushed, or in low grade material where fines are excessive.

It will pay you to get complete information about the competitive advantages this new attachment will give you for a comparatively small investment. Your Cedarapids dealer has all the details. See him today, or write to Iowa Manufacturing Company for information.



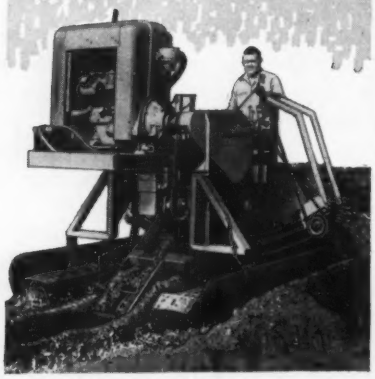
This Cedarapids Commander Crushing and Screening Plant, equipped with Pre-Screening Attachment, produced ¾" specification aggregate from a pit with high percentages of fines at a 170 ton per hour clip. The plant is owned by Pioneer Construction Company of Pueblo, Colorado.

Apply these Pre-Screening Advantages to Your Operations

- **Removes or by-passes excessive fines or dirt.**
- **Meets specifications calling for 100% crushed aggregate with three product sizes.**
- **Permits production of high type specifications from poor, contaminated pits.**
- **Increases plant capacity and cuts crusher maintenance by reducing the circulating load.**
- **Adds 80% more screening area to portable Commander and Junior Tandem plants.**
- **Handles high volumes of sand, or by-passes acceptable fines around plant for further processing.**
- **Combined with plant, will produce 5 sizes of finished product.**

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

You Can Make MORE MONEY WITH A Pow-R-Ditcher



Model 524T Pow-R-Ditcher

The heavy, rugged, maneuverable 524T Pow-R-Ditcher is ideal for contractors, muncipalities, utilities and institutions. Gives the performance you expect in larger units . . . but at less than half the price! Digs 24" wide at speeds of 1' to 15' per minute. One man operation . . . easy to transport. Many exclusive features.

Model 4T Pow-R-Ditcher

A powerful low cost "midget ditcher" for the light construction field. Only 48" wide, it can be transported in a pick-up truck. Excellent for laying gas pipe, water and cable lines and for digging foundation footings. Digs 6" to 14" wide at speeds of 1' to 17' per minute.

Write For Literature and Low Prices on the Complete Vermeer Pow-R-Ditcher Line

Or see your nearest Vermeer dealer. Compare quality, ruggedness, performance and price before you buy! Thousands of Pow-R-Ditchers in use from coast to coast.

VERMEER MANUFACTURING CO.

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EQUIPMENT NEWS . . .

continued

pickup truck. One operator can drive the unit into the field and make emergency repairs or even complete track overhauls at the breakdown site. The Trackmaster can handle all makes and sizes of tracks. The trailer-mounted unit is 12 ft 11 in. long, 7 ft 2 in. wide and 4½ ft high. Tires are 7.00-20, 10 ply. Completely equipped, the press weighs 5,400 lb. Power is supplied by a Wisconsin engine that develops 11 hp at 2,200 rpm.—**Owatonna Tool Co., 380 Cedar St., Owatonna, Minn.**

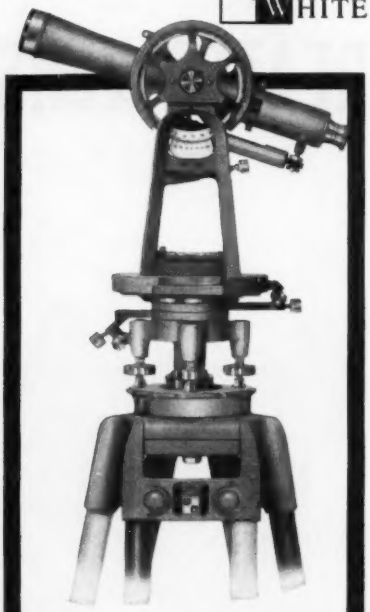
FREE LUBRICANT—A free can of Whitmore's Wire Rope spray lubricant will be sent to users writing the manufacturer. Whitmore has packaged its time-tested lubricant for wire rope and cable in a handy 16-oz aerosol container. A push of a button releases a fine spray that penetrates to the rope core to minimize internal friction. The lubricant also eliminates rust and corrosion, and it does not pick up abrasive dirt or dust. For a free sample can write: **Whitmore Mfg. Co., Cleveland 4, Ohio.**

WETS WATER — Contrary to popular belief, ordinary water is not very "wet." One of its drawbacks is its inability to instantly diffuse through or spread over materials such as cement. The addition of a concentrate called Veriwet will change the molecular structure of water so that its surface tension is almost as low as gasoline or alcohol. Otherwise it retains all the characteristics of the original water. One big application of Veriwet is for water used with cement guns. According to the manufacturers of Veriwet, when the concentrate is added to water it drastically reduces rebound, increases strength, and saves cement and aggregate applied with cement guns. The concentrate is contained in cartridges

contractors and engineers know

THE SIGHT IS RIGHT

WITH A DAVID WHITE



For Contractors—A brand new, heavy-duty transit designed for fast, accurate surveys in road construction, grading, other major jobs. Only one of its type on the market. Rugged, simplified construction with all the features you need: double centering, revolves 360 degrees for reverse readings, reads to one minute, vertically and horizontally. *T8200 Contractors' Transit* Includes new, American-style, wide-frame tripod. *Retails for **$375.00.**

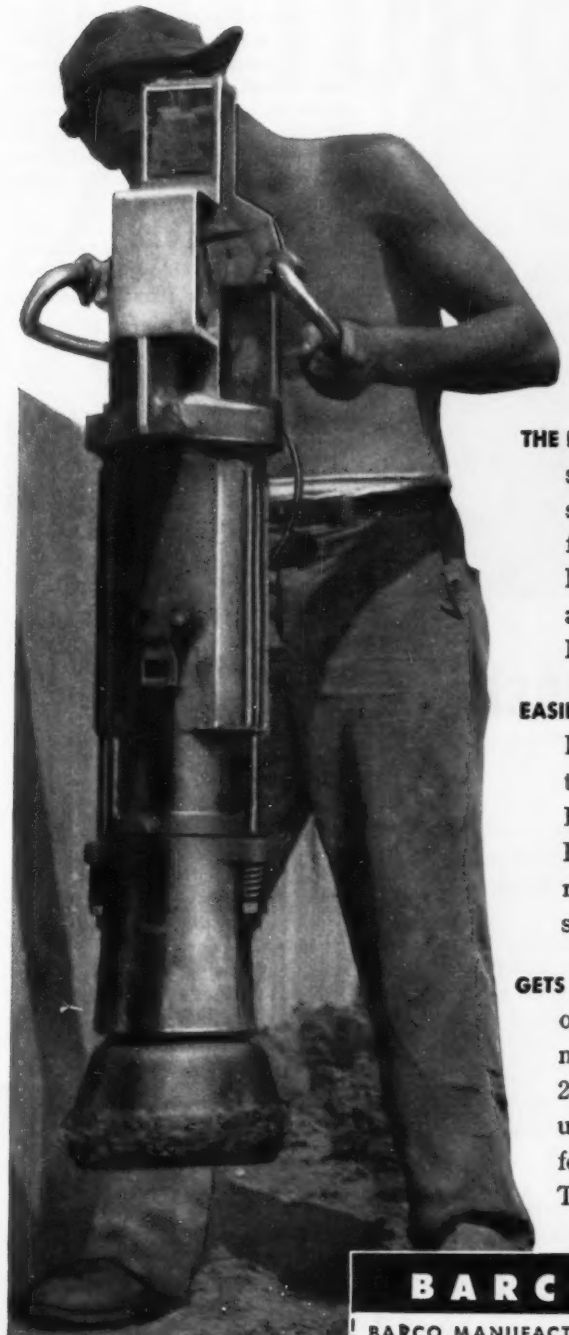
For Contractors—Heavy-duty instrument for general highway construction, for laying angles, to ascertain slopes, align piers, plumb walls, for tiling, and leveling of floors. *T8300 Universal Builders' Level Transit* Includes new, American-style, wide-frame tripod. *Retails for **$217.00.**

*The T8200 and T8300 may be purchased at 10 per cent down at your blueprinter, or lumber, building supply or hardware dealer. Write today for your free David White surveying instrument catalog.

Prices slightly higher west of the Rocky Mountains

DAVID WHITE INSTRUMENT COMPANY
Dept. B, 2051 North 19th St., Milwaukee 5, Wis.

WHEN CONSTRUCTION JOBS CALL FOR SOIL COMPACTION



BARCO is the ANSWER!

THE KEY TO BETTER CONSTRUCTION—No recent trend in construction has had a more phenomenal growth than the specification of HIGH DEGREE SOIL COMPACTION for all kinds of projects—Atomic Energy, Hydroelectric Power and Flood Control Dams, Highways, Toll Roads and Freeways, Airports, Bridges, Buildings, and Housing Developments!

EASILY MEETS RIGID SPECIFICATIONS—In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—EASILY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially useful for compacting fill in restricted areas. ONLY the Barco Rammer can produce specified high degree compaction on lifts up to 20 inches.

GETS JOBS FINISHED ON TIME—One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour. *When time is at a premium,* BARCO IS THE ANSWER—find out about it NOW!

For Soil Compaction Close to Walls, Culverts and Abutments —in Trenches, Ditches

BARCO *GASOLINE* RAMMER

BARCO MANUFACTURING CO.
512-E Hough St., Barrington, Illinois

Gentlemen:
YES! I want to know about Barco Rammers for Soil Compaction:

Name _____

Company _____

Address _____

PRODUCTS BACKED BY EXPERIENCE
BARCO
ANNIVERSARY
1908 50TH 1958

3-WAY SOIL BLENDER!

Here's the one multi-purpose tool every contractor needs to speed his work and make him more money! Solving soil problems is a specialty of Rome Disk Plowing Harrows. Have you ever encountered these problems?

1 Dead, dry dirt on the fill that blades like ashes and packs like sawdust? Wet it down with your water trucks, then mix it deep with a Rome Disk Plowing Harrow to put it in good shape for specified compaction.

2 In-place materials to mix? Soil cement materials, stratas or lifts in fills can be readily turned into a compact, homogeneous fill by mixing and pulverizing with a Rome.

3 Too wet to work? Blend wet soil with dry materials, plow deep with a Rome Disk Plowing Harrow to dry out your fills and cuts.

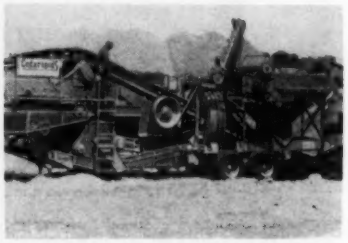
See your Rome Dealer for complete details — he is also your Caterpillar Dealer.

ROME PLOW COMPANY, Cedartown, Georgia

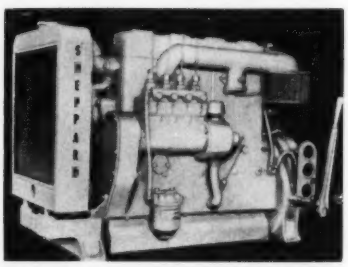
Rome Disk Plowing Harrows
REG. U. S. PAT. OFF.

EQUIPMENT NEWS . . .
continued

that are automatically introduced to the water by a mixer. The mixer mounts on the gun in any convenient location where it can drain by gravity when not in use. In operation, the top of the mixer is opened and a cartridge of Veriwet is inserted. Open the water supply valve and "wet water" is available immediately at the nozzle. Each cartridge makes over 1,000 gal of solution.—**Deynor Corp., 1 Depot Plaza, Mamaroneck, N.Y.**



DIESEL POWER—Two new diesel engines in the low power range have been introduced by Sheppard. The new engines are the model 17B rated at 25 hp at 2,000 rpm; and the model 19B (pictured), rated at 50 hp at 2,000 rpm. The small diesels incorporate many features found in much larger engines: replaceable wet-type liners; main bearings between each throw and at both ends of the crankshaft; full pressure lubrication including rocker arms and camshaft; oil bath air cleaner and oil-cooled pistons. Both engines have a 22-to-1 compression ratio. — **Sheppard Diesels, Hanover, Pa.**



EXTRA SCREENING—A new pre-screening attachment for Cedarapids portable crushing and screening plants provides two full decks of scalping area ahead of the crushing plant. The unit is designed to remove or bypass excessive fines or dirt—thus increasing the plant's versatility and production when working in

MOTOROLA 2-WAY RADIO COSTS YOU NOTHING

Your driver spends a good two minutes every hour in phone hunting, parking and checking in regularly every day. By eliminating just this, your Motorola radio *pays for itself*—but that's not all. It saves time and money a dozen other ways. In fact, many users report that Motorola 2-way radio control saves them *an hour a day* and more for every truck! And they're glad they chose Motorola—for the pioneer and leader produces equipment that *performs better* and *lasts longer*. Add it up for yourself—you'll see why Motorola 2-way radio costs you nothing—actually *makes money* for you! Why delay any longer? Contact Motorola today.

IF YOUR DRIVER SAVES 2 MINUTES AN HOUR WITH RADIO

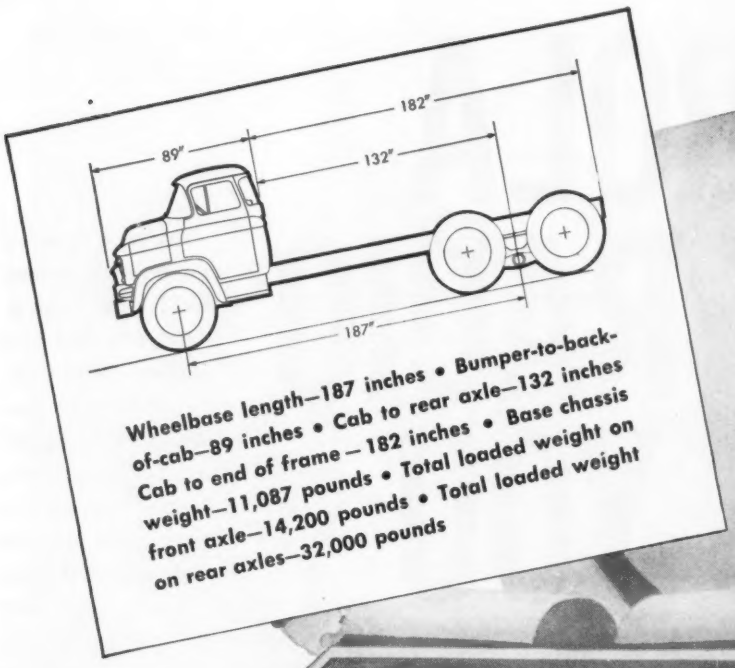
HERE'S THE PROOF

Even if your cost is as low as $5.00 an hour . . . $3.00 for the truck and $2.00 for the driver . . . saving as little as 2 minutes an hour* for each radio-equipped truck will more than pay for your Motorola 2-way radio system, including installation and maintenance. And after three years, the system is all yours!

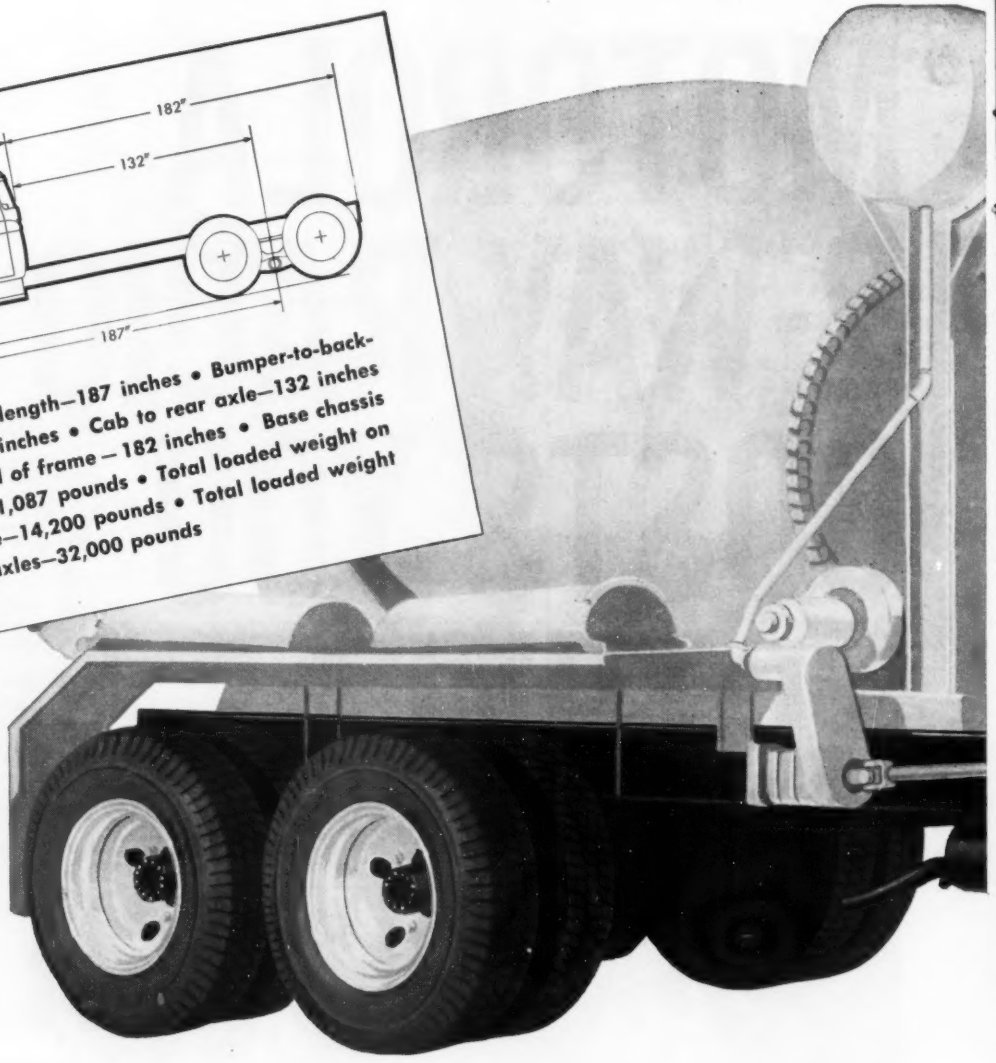
*Based on ultra-conservative three year amortization schedule.

MOTOROLA *2-WAY RADIO*

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC. • A Subsidiary of Motorola, Inc. • 4501 Augusta Blvd. • Chicago 51, Illinois



Wheelbase length—187 inches • Bumper-to-back-of-cab—89 inches • Cab to rear axle—132 inches Cab to end of frame—182 inches • Base chassis weight—11,087 pounds • Total loaded weight on front axle—14,200 pounds • Total loaded weight on rear axles—32,000 pounds



Now - haul 7 yards

in nearly all of the 48 States!

GMC's spanking-new FW556 is your truck! For no other regular, in-production model anywhere can haul 7 full yards at a clip — even in states with limitations as low as 46,400-lbs. gross

You see, this rig's all "muscle": with ⅜-inch heat-treated frame rails that eliminate the need for reinforcement — rubber "biscuit" mounting instead of steel springs—aluminum saddles and wheels.

The pay-off is a vehicle weight of only 11,087 pounds. Add 6,760 lbs. for a lightweight mixer, and you still have room for 28,350 lbs. of payload—all within a 46,200-lb. total.

ILLUSTRATED GMC FW556 MONEY-MAKER is just one of a complete line of GMC's *extra-stamina-engineered* for construction work. They're available with conventional, dual-purpose or c.o.e. cabs—gasoline or Diesel power—regular or Allison Torqmatic* transmissions.

**Optional at extra cost*

# of mix every trip

Power to haul these extra-size loads comes from GMC's 370-cubic-inch V8. It delivers 232 high-torque horsepower that takes on the toughest on-and-off-the-road work without breathing hard. And it turns the 7-yard barrel, too—through its front-end PTO.

But the real eye-opener is its price tag! For all these advantages are yours at a figure *hundreds of dollars* lower than anything else close to its class. Check that at your GMC dealer's!

GMC TRUCK & COACH—*A General Motors Division*

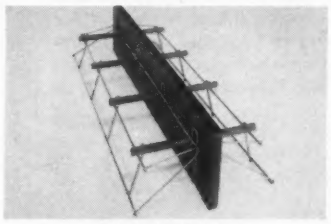
GMC-America's Ablest Trucks

Available in models from ½ to 45 tons

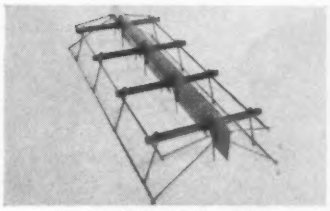
(Advertisement)

Make Better Highway Joints

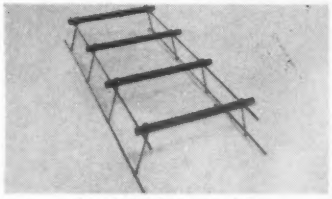
. . . with Sure-Grip Dowel Basket Assemblies, designed to meet the most rigid requirements of concrete highway construction.



Expansion Joint



Impressed Contraction Joint



Sawed Contraction Joint

Manufactured to meet all State, Federal and private specifications for highway and airport use. These heavy duty assemblies, similar to the three basic types shown above, are made to your exact specifications. Available for use in any thickness of slab. Sand plates optional.

Sure-Grip's manufacturing methods assure maximum strength and accurate alignment of dowels. The dowels stay in place in the concrete. Completely assembled at the plant,* the Dowel Basket Assemblies **nest** for easier, more economical shipping and storage. This permits greater handling ease and prevents welds from breaking.

FREE—Send in coupon below for complete information and the name of your nearest Sure-Grip dealer. We will be glad to help you figure your requirements.

*Less expansion core or impression plate.

THE DAYTON SURE-GRIP & SHORE CO.
520 Kercher Street, Miamisburg, Ohio

Without obligation, send me complete information about Sure-Grip Dowel Basket Assemblies and the name of my nearest Sure-Grip dealer.

☐ Please send free catalog of other Sure-Grip concrete accessories.

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Street_____

City_____ State_____

EQUIPMENT NEWS . . .
continued

low grade material where the percentage of fines runs high. The pre-screening attachment is interchangeable with the standard hopper and feeder of either a Cedarapids Commander of Junior Tandem plant. It consists of a double-deck horizontal vibrating screen with drives from the plant. Drive to the optional feed conveyor is also available. According to the manufacturer, the attachment, which can be installed in the field, adds 80% more screening area to a portable plant. The screen is mounted in a frame over a hopper containing a flop gate that can be arranged to take off all undersize material passing both screen decks before it reaches the crushers. It can also be used to blend any desired percentage of pit run fines with the crushed material to meet specifications.—**Iowa Mfg. Co., Cedar Rapids, Iowa.**

CRANE ATTACHMENT—The Utilo-Scope, a new telescoping grading and digging attachment, has been introduced by Quick-Way to replace the Chore-Master attachment introduced by the company last year. The hydraulically operated boom of the attachment extends to a radius of 31 ft and the bucket swivels from side to side and opens and closes with a wrist action. It can be removed or installed on Quick-Way cranes in less than an hour, according to the manufacturer. Several new features have been incorporated in the Utilo-Scope. An automatic disc brake on the bucket swivel permits easier and more positive positioning and holding of the bucket angle; an improved cylinder suspension system for the 6-ft main hydraulic cylinder prevents misalignment of the boom actuating gear; and new control levers mounted next to standard crane-shovel controls make possible simultaneous operation of all crane

Performance results: EXCELLENT

Take a look at these actual figures recorded by Southwest Sawing & Sealing Co., using Bay State's Krete-Kut reinforced blade at Love Field municipal airport, Dallas, Texas.

413,000 sq. yds. 13" concrete sawed 2¼" deep, ¼" wide in one pass at 9 ft. per minute. Aggregate composition: 60% Chico Limestone, 40% River Gravel. Blade cost per inch foot: Less than half a cent.

Try Krete-Kut on your next job and see if it doesn't pay off. Your Bay State man is ready to cooperate in comparison tests anytime.

BAY STATE WHEELS of PROGRESS

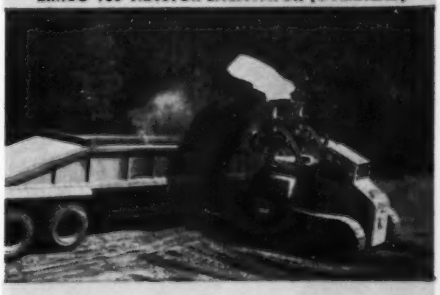
BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Mass.
In Canada: Bay State Abrasive Products Co., Brantford, Ontario. *Branch Offices:* Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. *Distributors:* All principal cities.

EIMCO 105 FRONT END SHOVEL

EIMCO 105 TRACTOR-DOZER

EIMCO 105 TRACTOR-EXCAVATOR (OVERHEAD)



"HELL FOR STOUT"

This phrase — customers (the world over) have learned from experience — is the most accurate way to describe the design and construction of Eimco Equipment.

For over three-quarters of a century Eimco has built machines for the rock loading and earth moving industries that are offered to do the tough, hard jobs. You can get a lot more for your money when you buy the Eimco Tractor-Dozer, or the Eimco Tractor-Front End Shovel, or the Eimco Tractor-Excavator (Overhead).

These are tractors that are built to do the job for which they were sold — they are not like all competitive machines — adaptations of agricultural or industrial machines.

Check these exclusive features that you get ONLY when you buy an Eimco:

2. Full visibility — operator sits up-front.
2. Fast maneuverability — independent track control — power shift.
3. Low center of gravity — climbs 100% grades.
4. Torque converter — elimination of master clutch, gear shifting and levers.
5. Unitized construction — fast, easy maintenance.

Why settle for less — demand the best for your equipment dollars.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Pittsburgh, Pa. Seattle, Wash.
Cleveland, Ohio Houston, Tex. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-315

when new aluminum coating holds up so well

On galvanized structures, the rusting caused by atmospheric corrosion usually begins with the bolts and nuts. In time, this presents a serious maintenance problem. But now, at slight extra cost, you can obtain coated fasteners which are so rust-resistant that they outlast any other part of a galvanized structure. These fasteners are coated with Bethalume, Bethlehem's new aluminum coating.

The Bethalume hot-dip coating makes possible a much longer service life for fasteners by adding the corrosion resistance of aluminum to the strength of steel.

Bethalume coatings stand up especially well under "heat-corrosion," at lower cost than products customarily used. Moreover, the Bethalume coating is unusually uniform—not merely on the body of each bolt, but over the entire threaded portion as well, thus making possible threads which are clean and smooth-fitting.

We have a new illustrated booklet on the Bethalume coating, which describes its advantages in detail. If you would like to have a copy, just drop a line to the Bethlehem office nearest you.

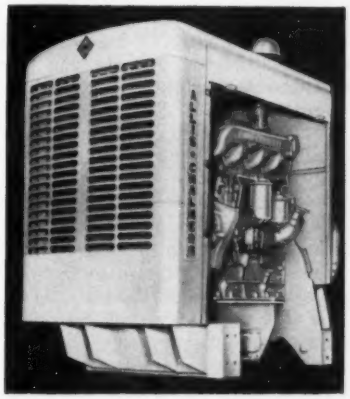
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

and hydraulic actions. The Utilo-Scope boom is an all-welded box-type boom that is raised or lowered by the main hoist cable of the crane. Crowd down pressure is provided by the haul-back cable. Telescoping of the boom is accomplished by hydraulic power to a cylinder that operates a rack gear. Bucket action, which is also hydraulic, is controlled by a smaller cylinder and a rotating Hydro-Motor.—**Quick-Way Truck Shovel Co., P.O. Box 1800, 2401 E. 40th Ave., Denver, Colo.**



LINE INCREASED—Allis-Chalmers has added the 88-hp model D-344 and the 131-hp model D-516 (pictured) to its line of diesel power units. The engines are designed for crusher plants, generator sets, and for other applications where general utility power units are adaptable. Working speeds of both engines vary from 1,000 to 1,800 rpm. The D-344 is a four-cylinder unit and the D-516 has six cylinders. Features include Allis-Chalmers' follow-through combustion system, which assures fuel economy; full pressure lubrication and thermostatically controlled cooling systems; and a 24-v electrical starter and generator. Both engines use the single plunger type, self-lubricated fuel injection pump. Two large-capacity filters protect the fuel pump and nozzles from dirt and water. Overall width for both engines is 33 in. Length from radiator to clutch is 64¾ in. for the D-344 and 80 7/16 in. for the D-516. Height to the top of the radiator is 51⅜ in. for the D-344 and 51⅞ in. for the D-516. —**Allis-Chalmers Mfg. Co., Tractor Group, Milwaukee, Wis.**

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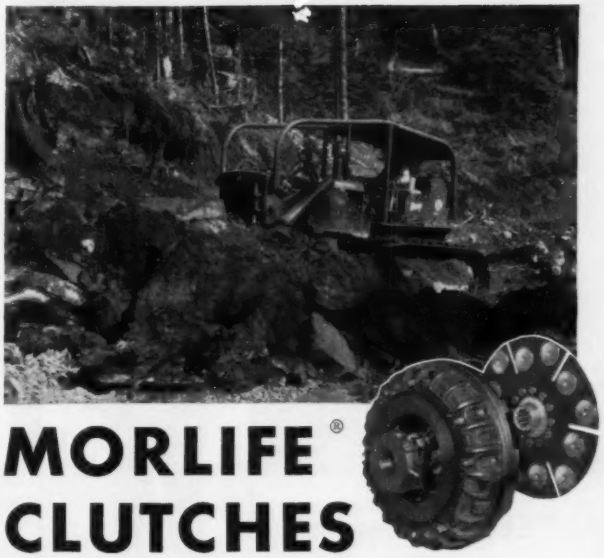
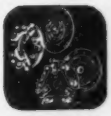
ROCKFORD



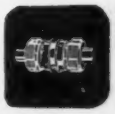
MORLIFE® CLUTCHES

Control Power Better in the Heaviest-Duty Machines

ROCKFORD Over-Center CLUTCHES, equipped with MORLIFE clutch plates, provide 100% more torque grip than previous type clutches of equal size. This permits the use of smaller diameter clutches. Easier operation is accomplished by reducing the required engaging pressure. 50% better heat disposal avoids down-time caused by burned or warped plates. Numerous field records prove that MORLIFE clutches operate 400% longer without plate replacement or adjustment. Let these NEW type clutches help improve the operation of your heavy-duty machines.


Small Spring Loaded

Heavy Duty Spring Loaded


Oil or Dry Multiple Disc

Heavy Duty Over Center

Power Take-Offs

Speed Reducers

BW **SEND FOR THIS HANDY BULLETIN**
Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

ROCKFORD Clutch Division BORG-WARNER
1331 Eighteenth Ave., Rockford, Ill., U.S.A.
Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

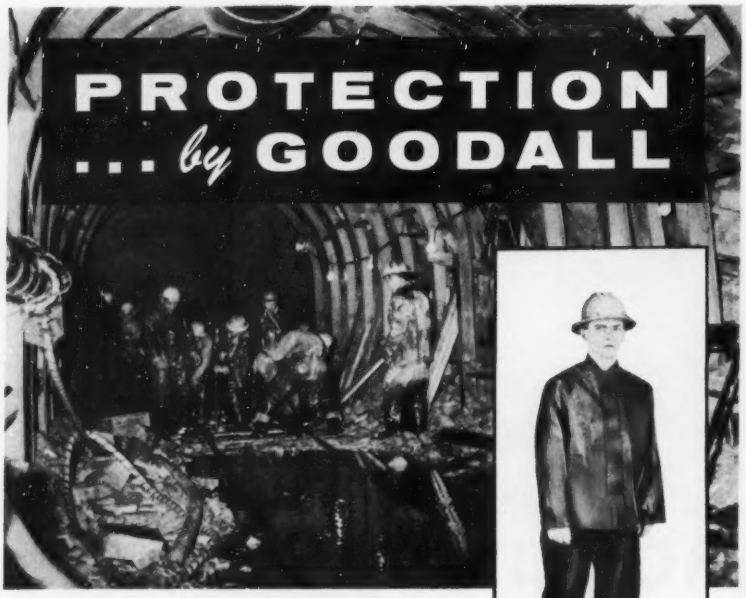
CLUTCHES

Precast Concrete in many Shapes and Uses

Precast Building Sections, Inc. is a supplier of many different types of precast concrete shapes and forms, such as structural panels for the First Presbyterian Church in Stamford, Connecticut, including those that contain the colored glass.

Wall panels: hollow-core, sandwich, perforated and patterned types; structural members; vault boxes and specialty concrete items are manufactured according to specifications and delivered on the site. Engineering aid available. Feel free to call for prompt information, quote or delivery.

PRECAST BUILDING SECTIONS, INC.
21 East 40th Street, New York 16, N. Y. **LExington 2-2731**



GUARANTEED *Waterproof* CLOTHING • FOOTWEAR

GOODALL provides head-to-toe protection, in every wet-work and wet-weather job, with a complete line of guaranteed waterproof hats, clothing and footwear—famous for comfort, quality and economy.

COATS, JACKETS and **OVERALLS,** in rubber, oiled and latex constructions, are durable, full-cut garments made from selected materials to the highest standards of craftsmanship. Heavy reinforced where extra wear-resistance is essential, without imparing comfort and freedom of movement. Available in a variety of styles, in all sizes, including No. 338 Coat with double back and corduroy-lined collar—a long-time favorite.

STYLE 80-81 SHAFT SUIT
A rugged, waterproof suit built to withstand the hardest kind of wear. Jacket is dull finish rubber on natural sheeting. Three-piece body. Square shoulders. Storm fly front with ball and socket fasteners; low standing collar with corduroy tip; eyelet ventilation under arms. Overalls are dull finish rubber on natural sheeting. Bib front; suspender straps with adjustable buckles; rubber straps on sides tie in back; grommet adjustment at waist.

"TOE-SAVER" BOOTS

Smooth, tough, flexible black rubber, heavy duck lined Cushion insole. White cap over reinforced steel safety toe tested to withstand 2,000 lbs. pressure. Tiretread soles. Hip, Storm King and Short. All with permanently marked size numbers.

The "Toe-Saver" feature is also available on a variety of work shoes, and on our "Contractors" Mucker Boot.

"HARDBOILED" SAFETY HATS

Light weight and comfortable, yet providing greatest possible head protection. Exceed highest established requirements for strength, heat and moisture resistance, and di-electric tests. Made of fibreglass or aluminum in white and colors.

"If it's Goodall, it MUST be Good!"

Contact Our Nearest Branch or Write for Catalog

Standard of Quality—Since 1870

HOSE · BELTING · FOOTWEAR · CLOTHING AND OTHER INDUSTRIAL RUBBER PRODUCTS

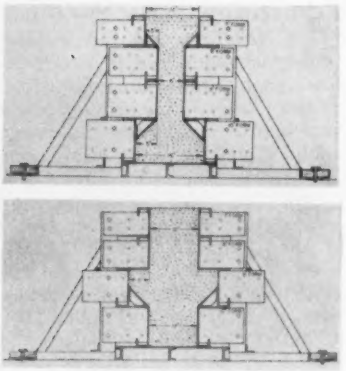
GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

BRANCHES AND DISTRIBUTORS THROUGHOUT THE UNITED STATES.
IN CANADA: GOODALL RUBBER CO. OF CANADA LTD., TORONTO.

EQUIPMENT NEWS . . .

continued



VERSATILE FORMS — Blaw-Knox's new line of steel forms for prestressed concrete can be adapted to produce a range of shapes and sizes. Key to the form is its unit design. Sidewalls are made up of a series of panels that can be varied in several ways. The panels can be re-arranged in sequence from top to bottom or they can be shifted horizontally. Over-all height can also be adjusted with the addition of fillers. The side panels are held in position on a separate frame by adjustable plates on either side of the form. A series of holes punched in these plates and the frame permits lateral or vertical adjustment. With the four-panel form illustrated adjustments can be made to produce I-beams, specially designed building beams, or hollow box girders. The panels are 7, 8, 9, and 10-in. high. Forms are normally furnished in 10-ft long panels, but special panels can be made in various heights to produce the beams most often cast by a prestress beam manufacturer. To produce the various slopes necessary to form haunch beams or I-beams, Blaw-Knox furnishes special bevel panels. — **Blaw-Knox Co., 300 6th Ave., Pittsburgh 19, Pa.**

MOTOR IN HEAD—Stow's newest concrete vibrator features a rugged 60-cycle motor that is enclosed in the 2⅝-in. head of the unit. The completely sealed universal motor powers the head at 12,000 to 15,000 vibrations per min, according to the manufacturer. An automatic shutoff protects the motor in case of head build-ups or overloads. The rest of the vibrator consists of a casing that acts as a handle, a covered off-on switch located 7 ft

This Model TD Rear Dump Euclid offers a 10-speed Fuller 10-F-1220 Transmission.

A 5-speed Fuller 5-F-1220 Transmission gives rugged dependability to this Euclid R-18 Rear Dump Truck.

This Euclid S-12 Hydraulic Scraper is powered through a 5-speed Fuller 5-F-1220 Transmission.

Geared by FULLER . . .

For heavy-duty earthmoving and mining equipment, leading manufacturers standardize on Fuller Transmissions . . . for these good reasons:

Fuller Transmissions are designed and built for long, trouble-free service under the most severe operating conditions. These heavy-duty transmissions provide smoother shifting, longer engine life and the right gear ratios for the job . . . all performance features that add up to faster work cycles and greater profits for Fuller Transmission users.

• • •

From more than 100 models available for rubber-tired equipment, you'll find a Fuller Transmission designed to do your job better . . . and at lower-than-ever operating cost.

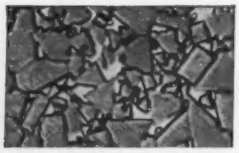
FULLER

TRANSMISSIONS

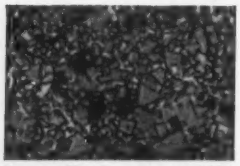
FULLER MANUFACTURING CO. Transmission Division • Kalamazoo, Mich.

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

Longer bit life—with *new* Sandvik Coromant Bits



Sandvik Coromant Tungsten Carbide. (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.



Low quality Tungsten Carbide. (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

NEXT time you buy bits, specify Sandvik Coromant because they give you more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used—as shown in the microphotos above. This means less wear, longer life and a better job.

2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

THESE STANDARD SIZES ARE AVAILABLE																
	THREAD	DIAMETERS AVAILABLE (IN INCHES)														
SHOULDER TYPE	7/8" F	1½														
	1" H	1½	1⅝	1¾	1⅞											
	1 3/16" D					2	2⅛	2¼	2⅜	2½	2⅝	3				
	1 11/16" K											3	3½	4	4½	
BOTTOMING TYPE	1¼" Rope				1⅞	2		2¼		2½						
	1½" Rope									2½	2⅝	3	3½	4		
	2" Rope												3½	4	4½	5
	400					2		2¼		2½						
	600									2½	2⅝	3	3½			

Shaded area indicates X-Bits

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels—the most widely used in the world—and Sandvik Coromant extension steel equipment.

Write, phone or cable today for further details to any of the addresses below:

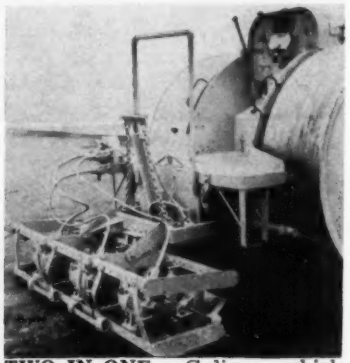
Atlas Copco

ATLAS COPCO EASTERN	*P.O. Box 2568, Paterson 25, N.J. Phone Armory 4-3310*
ATLAS COPCO PACIFIC	*930 Brittan Ave., San Carlos, Calif. Phone Lytell 1-0375*
ATLAS COPCO CANADA	*Montreal Airport, Quebec. Phone Melrose 1-5571*
ATLAS COPCO MEXICANA	*Apartado Postal 56, Torreón, Coahuila. Phone 39-07* DST-70

EQUIPMENT NEWS . . .
continued

from the head, and a 25-ft electric cable that plugs into either AC or DC 115-v current.—**Stow Mfg. Co., 31 Shear St., Binghamton, N.Y.**

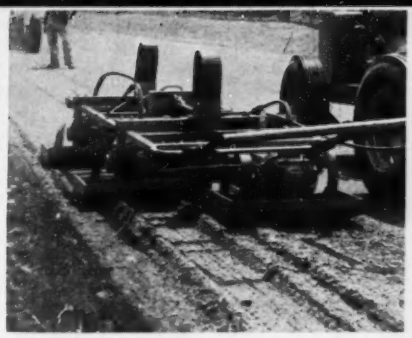
MUD-HOG—Marlow's new portable diaphragm pump weighs only 126 lb in a base-mounted model and 137 lb as a wheel-mounted unit. Called the model 302B, the new pump is an addition to Marlow's Mud-Hog line. The lightweight pump is powered by a 2-hp Briggs & Stratton four-cycle engine with a recoil starter. It has a crank-type drive and gears run in an oil bath. To keep weight to a minimum, the pump body is aluminum. Air chambers on the pump section and discharge reduce surges and make operation smoother. Suction and discharge pipe nipples are steel for longer thread life. —**Marlow Pumps, Midland Park, N.J.**



TWO-IN-ONE — Galion, which recently made available a motor grader with a compaction unit, now has added the Jackson electric vibratory compactor to its three-wheel Roll-O-Matic rollers. The two-in-one machine provides simultaneously the compressing action of the roller plus the consolidating action of vibration. The

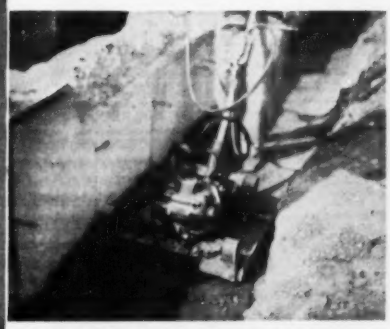
10 Leads *to better, faster results and BIGGER PROFITS!*

MACADAM DENSIFICATION. The Jackson Multiple Compactor gives you base and sub-base compaction at its quickest and best. Each of the 6 units in workhead delivers 4200 3-TON BLOWS per minute.



PAVEMENT WIDENING. Any arrangement desired of the vibratory units of the Jackson to fit the job most advantageously and provide 100% of required density in ONE PASS is easily and quickly made.

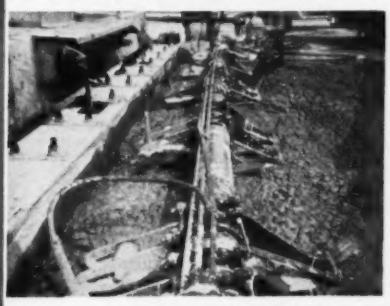
GRANULAR SOIL FILLS. The Multiple Compactor quickly achieves specified density, gets into places bigger, more expensive equipment cannot reach. Individual units can be detached, operated as manually guided compactors.

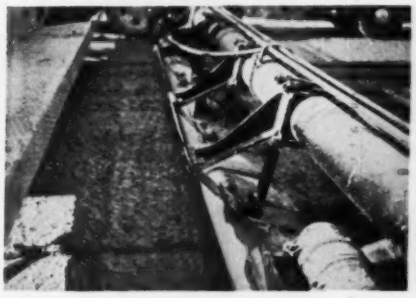


SOIL COMPACTION. Self-propelling, the Jackson Compactor, with 12" to 24" interchangeable bases, achieves specified density of granular soils in 6" to 8" layers at the rate of 600 sq. yds. per hr. Perfect for bridge and pipe line fills, concrete floor sub-bases and similar applications.

BLACKTOP WIDENING & PATCHING. The same machine operated from power plant on auto-trailer with pickup for Compactor is most efficient means of blacktop pavement patching, paving walks, drives, etc. Will compact up to 600 sq. yds. per hr close to maximum density.

TWIN-UNITS — ONE OPERATOR. With a two-unit, side-by-side or tandem hookup of JACKSON COMPACTORS, one man can readily do the work of two, since the compactors are self-propelling and he has only to guide them.





CONCRETE VIBRATION FOR HIGHWAY AND AIRPORT PAVING

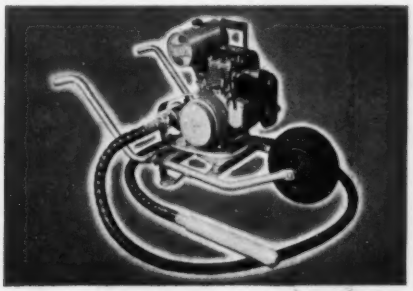
INTERNAL TYPE; super-powered, gives full width internal vibration through full depth of very thick slabs. Saves time, cement; provides greater density and compressive strength.

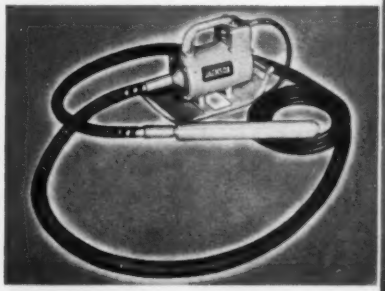
SURFACE TYPE; does perfect job of vibrating all mixes in depths used on highway projects. The owner of a JACKSON Paving Tube can quickly switch from internal to external vibration, or vice versa, at minimum expense.

MUNICIPAL PAVING: This vibratory screed strikes off to all crowns, undercuts at curb or sideform, works right up to and around obstructions, is rolled back for second passes on 4 rollers. Most productive and convenient screed made.

JACKSON
VIBRATORS, INC.
LUDINGTON, MICHIGAN

FOR SALE OR RENT AT YOUR
JACKSON DISTRIBUTOR





GENERAL CONSTRUCTION

(Left); 6 H.P. engine-driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right); 2½ H.P. electric vibrator (for light-socket operation). Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 28'.

Oklahoma Contractor Cuts Costs on 14-Foot-High Walls

BAPTIST MEMORIAL HOSPITAL
Oklahoma City, Oklahoma
Contractor: G. E. Bass Construction Co.
Oklahoma City

In forming these 14'0" walls, G. E. Bass Construction Company substantially reduced labor and material costs — and gained quality concrete — with GATES VERTICAL ROD HIGH WALL SYSTEM.

With this versatile Gates System, walls were formed simply by stacking plywood form panels horizontally to the desired height. Walering and bracing, used only for alignment purposes, were held to an absolute minimum. No other backing or panel fabrication was required, even though a slight radius wall was specified in the job. Stripping was accomplished quickly and easily with a minimum crew.

If you are not using Gates, it'll pay you to investigate this simplified, cost-cutting forming system. For the name of your nearest Gates representative, write:

SEE OUR CATALOG IN SWEET'S ARCHITECTURAL FILE OR WRITE FOR COPY

Gates & Sons, Inc.
80 So. Galapago St. Denver 23, Colorado

GATES IT'S GALVANIZED

CM 4/58

YES! YOU CAN BUY DIRECT
SEND US YOUR ORDERS FOR
NEW ROTARY SWEEPER BROOM CORES

$69.50

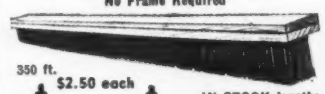
We Manufacture All Sizes
- DETROIT-HARVESTER
- FORDSON
- GRACE (3 TYPES)
- HOUGH
- HUBER
- LULL
- LITTLEFORD
- LITTLE GIANT
- MELI (M-B) BLUMBERG
- ROSCO
- SPEARSWELL

AND MANY OTHERS
ALSO CORES MADE TO YOUR SPECIFICATIONS

Suggestion — TO FAR AWAY USERS ORDER CORES ONLY WITHOUT ANY FIBRES BUT READY TO FILL

Also Furnished Filled With Palmyra-Hickory or Bass Fibres or Even Spring Steel Wires
WE SHIP WORLDWIDE—IMMEDIATELY

ROAD BUILDERS—IT'S SENSATIONAL!
BIG PECKERWOOD BIG
C-O-N-T-I-N-U-O-U-S
Drag Broom Levelers with Spring Steel Wires or Bass Fibres Six Inches Wide and Length to 12 Feet and Also Three Inches Wide
No Frame Required



350 ft.
$2.50 each

IN STOCK lengths 4', 6', 8', 10' or 12'
Wt. approx. 5½ lb/ft.
The LITTLE PECKERWOOD
3" Wide 15" Long with the Two Bolts Fits Your Present Frame

ALSO MADE C-O-N-T-I-N-U-O-U-S

KENNEDY'S
VAN BRUSH MFG. CO. INC.
SINCE 1928
327 S. West Blvd., Kansas City, Mo.

MAYO
PNEUMATIC GROUTER
and
"PEA SHOOTER"

Simple to Operate
Highly Efficient

The Mayo Grouter quickly and easily places low-pressure grout in tunnels, mines, shafts, foundations, and subgrades. It also may be used to inject sodium silicate emulsions for stabilizing caving or running ground.

This versatile piece of equipment can readily be converted to a "Pea Shooter" for shooting Pea or "Birds Eye" gravel back of liner plates and backpacking outside lagging plates.

Write for Free Bulletin 13 for full details and specifications.

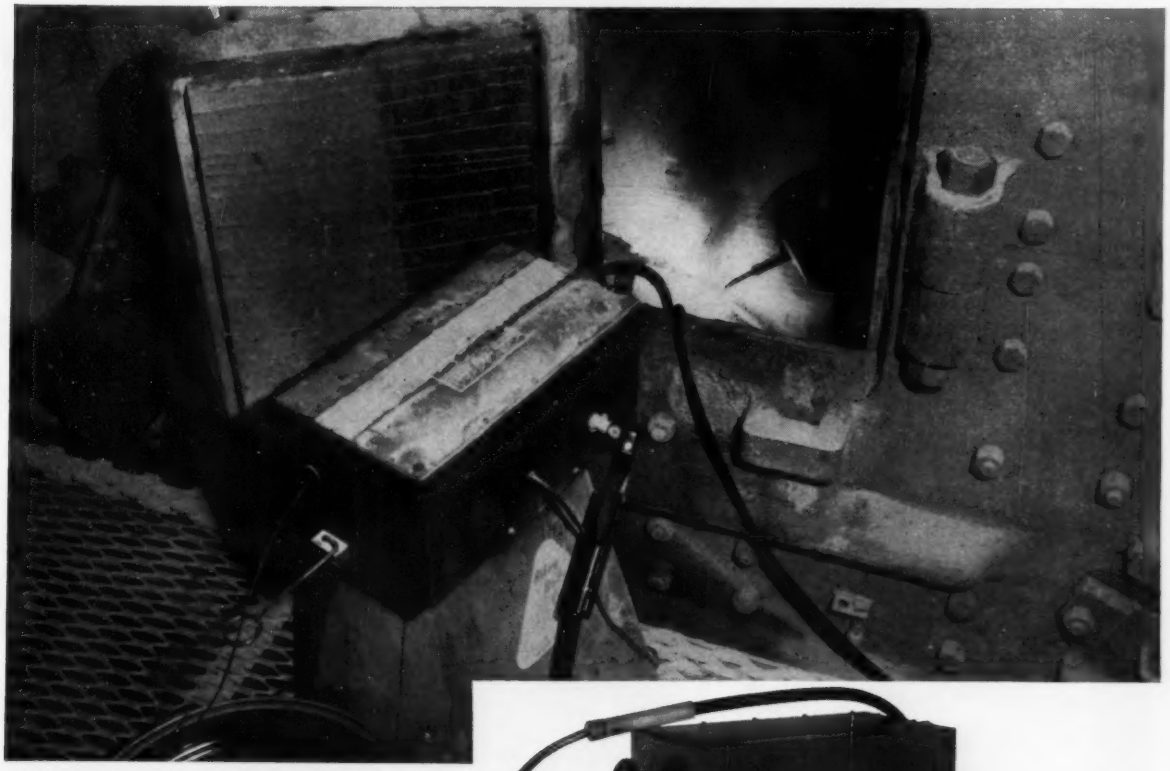
MAYO
MAYO
TUNNEL AND MINE EQUIPMENT
LANCASTER, PENNA.

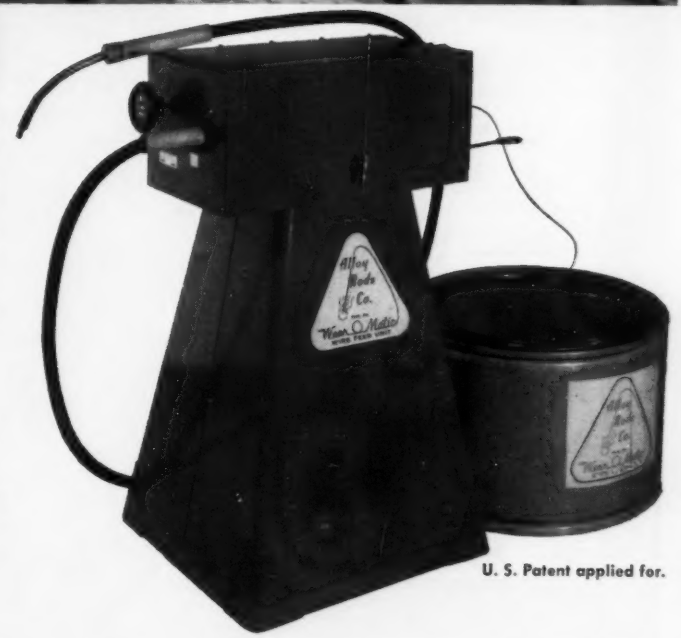
EQUIPMENT NEWS...
continued

compactor workhead consists of three 26-in. wide steel plate shoes that are individually vibrated by an electric motor mounted directly on each shoe. The shoes are suspended from a box-type frame so that they can float on the surface being compacted. The unit is connected to the rear of the roller and it can be raised by hydraulic power from the operator's platform. A separate gasoline engine drives the generator that powers the vibrator motors. Engine and generator are mounted on the side of the roller frame. The vibrator is available on Galion Chief or Warrior Roll-O-Matic three-wheel rollers. — **Galion Iron Works & Mfg. Co., Galion, Ohio.**

STOPS FASTENERS — A new powder-actuated fastening tool that stops an overdriven fastener in its tracks, thereby eliminating the danger of firing through a thin work surface, has been developed by Ramset Fastening System. Called Flite-Chek, the gun controls the fastener through a new assembly with tapered interceptor jaws that prevent the passage of an overpowered fastener or one that encounters a soft spot in the work surface. The fastener is stopped before it leaves the tool. To free the gun, the operator simply pulls the tool off the work and then he is ready to place another fastener. The Flite-Chek tool operates in much the same way as other Ramset powder-actuated tools. A pull of the trigger seats the fastener into a wide variety of non-brittle materials. The tool is capable of sinking a fastener into as much as 1 in. of steel. It is designed to handle threaded studs. The new tool, which uses the same type of powder loads and fasteners as

"Saved 50% on Crusher Maintenance with WEAR-O-MATIC wire feed unit and wires."





U. S. Patent applied for.

"We've had our Wear-O-Matic Wire Feed Unit for three months and we'll cut hard surfacing maintenance time on our 5360 and 4350 Cedar Rapids crushers by at least 50%. For the first time it looks as though our weldor will be able to do the right kind of a job on these crushers with enough time left over to do an adequate job on the shovels and other equipment."

"In addition to a savings in time, we find that Wear-O-Matic wire deposits wear longer than the deposits of stick electrodes we have used. Also, our weldor likes to work with your machine and Payoffpak wires . . . it's the easiest to set up that he has ever used."

Maintenance Superintendent
Lincoln Stone Inc., Thomasville, Penna.

The customer has told only part of our story . . . may we add—The Wear-O-Matic wire feed unit sells for only $279.00 f.o.b. York, Pa. or El Segundo, Calif. For complete details write requesting Bulletin HS-122: Alloy Rods Company, P. O. Box 1828, York, Penna.

See Demonstrations • AWS SHOW • ST. LOUIS, MO., • APRIL 15-17

Alloy Rods Company

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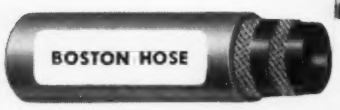

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BELTING

V-BELTS

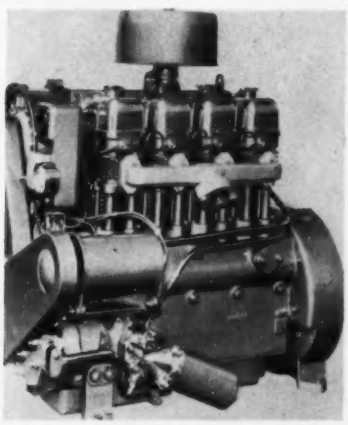
PACKING

MATTING

TAPE

the standard Ramset Jobmaster, sells for $149.50.—**Ramset Fastening System, Cleveland, O.**

ALUMINUM DUMP TRUCK — A huge dump truck with an aluminum body that is said to give it an 11,000-lb payload advantage over a steel body of comparable size has been designed to haul bauxite for Alcoa in the Dominican Republic. The truck has a capacity of 37½ yd. and it weighs 26 tons. The big truck is powered by 335-hp turbocharged diesel engine through a four-speed transmission and torque converter. A feature is the heated dumper floor. Hot engine gases are channeled into the body to facilitate dumping of moist and sticky bauxite. The truck measures 30¼ ft long, 12 1/3 ft wide, and 11 ft 11 in. high.—**Mack Truck, Inc., Plainfield, N. J.**



SMALL DIESELS—Introduction to the American market of a line of high-speed, lightweight engines that make it practical to use low-cost diesel power for pumps, power buggies and other small equipment has been announced by Petters Ltd of England. The new Petters diesel engines range in weight from 243 lb for the single-cylinder PC-1 to 503 lb for

New STOW
1-MAN VIBRATOR
saves time...
cuts costs!

A Complete Line of Concrete Construction Equipment.

Vibrating Screeds

Grinders

Roto-Trowels

Vibrators

This lightweight, high-speed STOW YU Vibrator is extremely compact and easy to carry. It's a rugged, 60-cycle motor-in-head vibrator with completely sealed vibrator powered by a Universal motor which drives the head at 12,000 to 15,000 VPM.

The YU features strong, wear-resistant casing which covers the electric wires and also acts as a handle; a completely encased off-on switch located 7 feet from the head; and a 25-foot cable that plugs into any regular AC or DC volt outlet. Built for ease of operation and safety, the YU has a thermal overload protection which shuts off the motor in case of heat or overload.

Standard equipment includes: Model YU (2⅝") vibrator head and 25 feet of cable. The YU is available with 7, 14 or 21 feet of 4-ply, neoprene covered casing.

For more information on the new Stow YU Vibrator, phone your nearest Stow Distributor. (You'll find him listed in the yellow pages of your phone book under "Concrete Vibrators") . . . or

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help "heavyweights" work longer...do the job faster

ON NATION'S MAJOR ROAD PROJECTS!

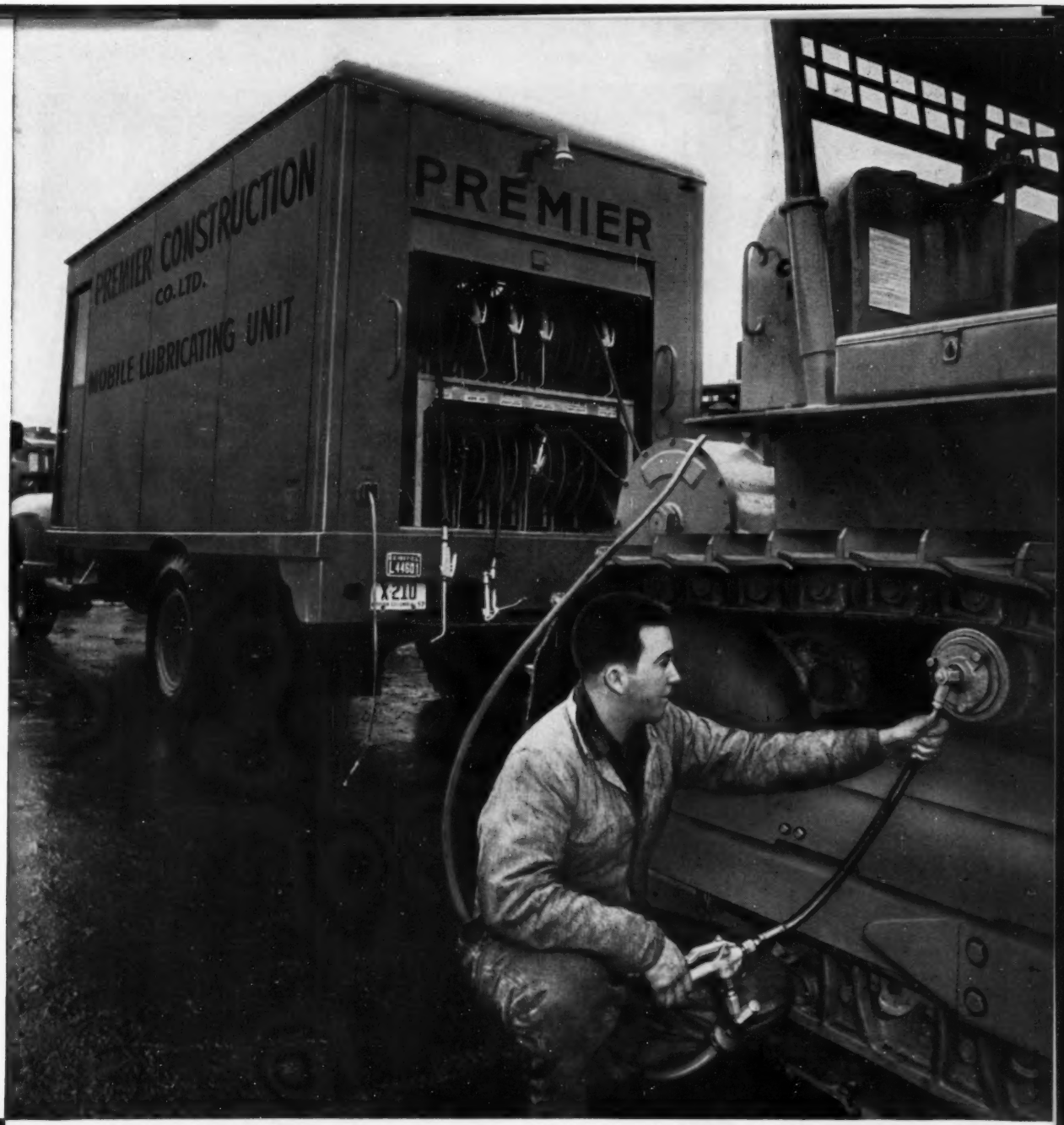
On America's great new road jobs—and in Canada, too—Alemite power lubrication rigs help leading contractors win battles against time and high maintenance costs.

64% faster than hand lubrication methods, Alemite portable power units service equipment *on the job*—wherever and whenever they are needed. They eliminate costly delays due to slower lubrication methods . . . end trips to and from the grease shop . . . reduce chance of costly bearing failures.

Whether your operation is large or small, an Alemite outfit can be custom-built from standard Alemite equipment to meet your particular needs . . . and to give you important savings in time, money and equipment.

OPEN FLAT BED—7-pump, 9-reel service station built by W. E. O'Neil Construction Company.

COMBINATION OPEN AND CLOSED UNIT—owned by Kuckenberg Construction Company, Portland, Oregon.



ALL-WEATHER VAN TYPE—used by Premier Construction Company, Ltd., British Columbia, 13 pumps, 14 reels.

ALEMITE PORTABLE SERVICE STATIONS HAVE HELPED CONTRACTORS BUILD:

Illinois Toll Road • Northern Indiana Toll Road • New York State Thruway • Chicago Congress St. Expressway • Savannah River Atomic Energy Project and many other nationally known projects!

Fast, easy lubrication of track rolls and fittings.

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No engine oil wasted — delivers exact amount of oil required.

Air line equipment for on-the-job tire inflating, air cleaning.

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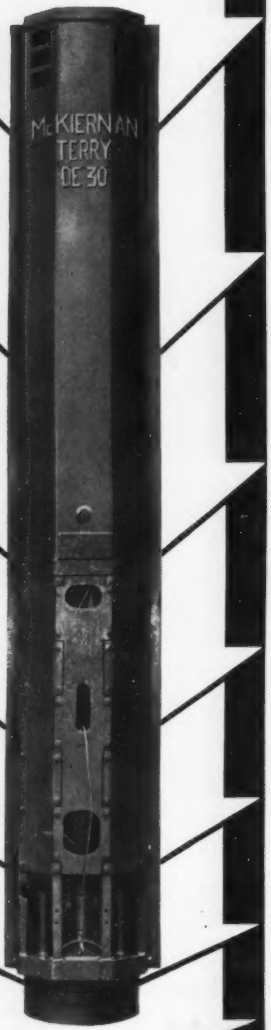
are self contained — no steam — no air — a small quantity of fuel oil for all-day operation — high driving rate — simple design — easy to maintain — write for Bulletin 67R.

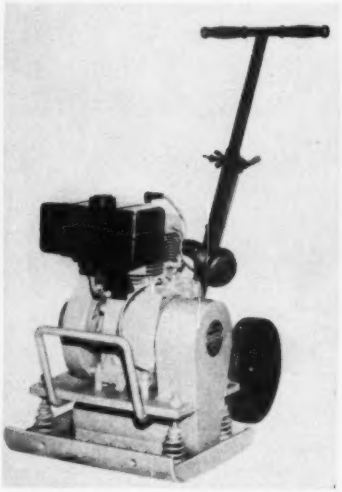


McK T

McKIERNAN-TERRY CORP.
110 RICHARDS AVE., DOVER, N.J.

EQUIPMENT NEWS . . .
continued

the four-cylinder PC-4 (photo). Horsepower output ranges from 6.25 for the smallest engine to 25 for the PC-4. Other engines in the line are the two-cylinder PC-2, which weighs 329 lb and develops 12½ hp; and the three-cylinder PC-3, which weighs 439 lb and develops 18¾-hp. All models in the PC series operate at a constant speed of 3,000 rpm. Petters Ltd is a member of the Brush Group Ltd, world's largest producer of diesel electric plants. The diesel engines will be distributed through Peters American affiliate.—**Brush ABOE, Inc., 60-07 39th Ave., Woodside, N.Y.**



PACKS A PUNCH—Maginniss' new Pow-Pactor self-powered vibratory compactor offers variable frequencies from 2,400 to 7,000 vibrations per min and a compacting force of up to 4,000 lb. Designed for compacting and grading around foundations, footings, sewer trenches or bridge approaches, the compactor can also be equipped with rollers and a water attachment for work on blacktop. A 6-hp air-cooled engine, mounted on a vibration-free plate, drives the unit through V-belts. Damping springs also isolate vibration from the operator's handle. An eccentric rotates on high-speed bearings in a sealed housing attached to the compacting plate. The ⅜-in. thick steel compacting plate has 12x18-in. of effective working area. Weight of the complete unit is 250 lb.—**Maginniss Power Tool Co., 154 Distl Ave., Mansfield, Ohio.**

continued on page 237

INDIAN
DRINKING WATER & SUPPLY TANK NO. 75G

Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is curved to fit the back. Sturdy construction. Highly popular.

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Low-priced power Sprayer
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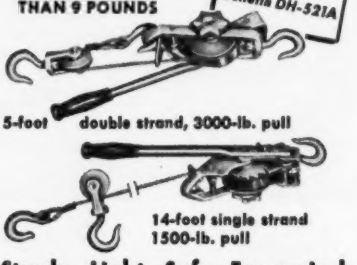
WRIGHT
Type "R" Pull-A-Ways

WEIGH LESS THAN 9 POUNDS

Write for Bulletin DH-521A



5-foot double strand, 3000-lb. pull

14-foot single strand 1500-lb. pull

Sturdy • Light • Safe • Economical

Here are some of the fine features of WRIGHT Type "R" Pull-A-Ways:

Drop forged ductile aluminum alloy frame • Wire hoist cable of maximum strength and flexibility • 8" minimum handle movement—for close hook-ups • 2" drum hub for cable • No oiling needed • Drop forged steel hooks • Removable, reversible "Safety Handle" that bends before any part of hoist is overloaded • Automatic load lowering, with positive control for safety. ACCO

Write our York, Pa., Office for Bulletin DH-521A for full story

Wright Hoist Division
AMERICAN CHAIN & CABLE
Bridgeport, Conn. • York, Pa.

How Dodge saves you money by matching your truck to your needs

Dodge medium- and heavy-duty trucks have always been built from a wide range of "Job-Rated" components to match a truck exactly to your job. This means that you aren't forced to pay for capacity you don't need, and you don't get undersized units that shorten your truck's life. Just look at the range of components today's line of *Power Giants* offers:

In power, there are Sixes from 125 to 141 hp., Power-Dome V-8's from 204 to 234 hp. Exclusive Power-Dome V-8 design reduces harmful carbon deposits, greatly reducing the need for engine overhauls to maintain maximum power.

In payload, numerous Dodge medium- and heavy-duty models offer G.V.W.'s from 11,000 to 46,000 lbs., G.C.W.'s from 30,000 to 65,000 lbs. in gradual steps. A wide range of "Job-Rated" axles, transmissions, tires, springs and other components makes possible gradual increases in capacity and assures you a dependable, economical truck because it fits your job exactly.

In economy, Dodge provides the thriftiest and most efficient engine and transmission combinations. A range of eight engines and eight transmissions, including automatic Torqmatic, makes this possible. You save on gasoline, too, because Dodge engines operate efficiently on regular gasoline!

Priced competitively throughout the line, in many models Dodge is priced *lowest!* No matter what Dodge *Power Giant* your job calls for, you'll be agreeably surprised at its thrifty price tag. See your Dodge dealer soon, and get his special 40th-Anniversary deal!

DODGE *PowerGiants*

Illinois Toll Highway

Chicago-Calumet Skyway

Chicago-Calumet Skyway

Illinois Toll Highway

Illinois Toll Highway

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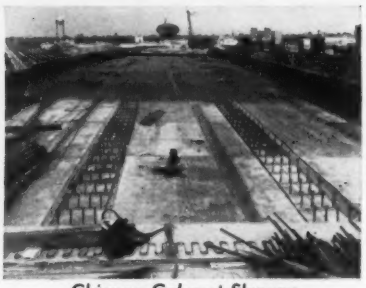
Chicago-Calumet Skyway



Chicago-Calumet Skyway

SUPERIOR ACCESSORIES For Bridge Abutments, Approaches, Grade Separations, Interchanges, and Decks

Various types of Superior Accessories provided money-saving forming in the bridges and related jobs pictured above. With the increasingly keen competition for this type of work, contractors have discovered that the efficient forming methods of SUPERIOR Accessories offer all-important bidding advantages. Some of these accessories are shown below.

Whenever you are planning form work . . . Superior's experienced engineering service is available to prepare form layouts, estimates and quotations. This comprehensive service is offered without charge.

Write for NEW 6-PAGE BULLETIN describing the Superior items for use in form work in the general field of bridges, both structural steel and prestressed concrete.

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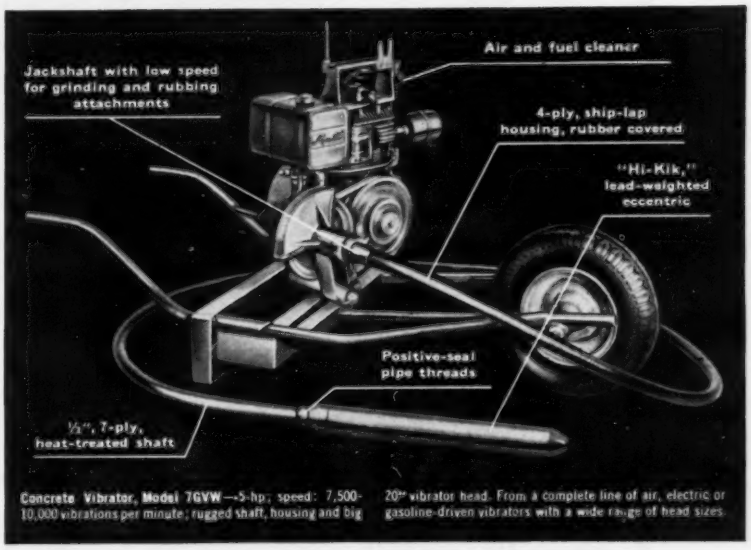
NEW YORK OFFICE
1775 Broadway
N.Y. 19, N.Y.

PACIFIC COAST PLANT
2100 Williams St.
San Leandro, Calif.

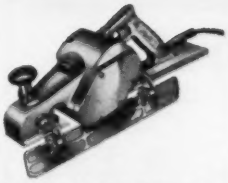
SELF - CONTAINED TOWER — Shepherd's new M420 portable light tower is a compact, lightweight, and self-contained unit mounted on skids to facilitate movement around a job. For job-to-job transportation, the rig can be disassembled in a short time and carried in a small truck. Power is supplied by a Universal 125-B gasoline engine. The tower has five 1,000-w flood lights with adjustable 16-in. reflectors. The height of the lights can be varied from 17 to 24 ft. Four auxiliary power outlets are available.— **Shepherd Machinery Co., 3400 S. San Gavriel River Parkway, Box 6789, East Los Angeles 22, Cal.**

SPEEDS ASSEMBLY — Special wrench sets and a new strap-vise have been introduced by Parker to facilitate assembly of its reusable Hoze-lok fittings onto rubber-covered no-skive hydraulic hose. Each set includes a speeder with revolving grip, a sliding T-handle, adaptors and wrenches to cover a wide range of hex sizes. The larger set accommodates fittings up through 1⅛-in. dia for

POWER to boost job efficiency with REMINGTON tools

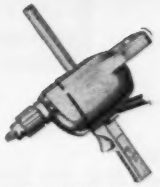

Jackshaft with low speed for grinding and rubbing attachments
Air and fuel cleaner
4-ply, ship-lap housing, rubber covered
"Hi-Klk," lead-weighted eccentric
Positive-seal pipe threads
½", 7-ply, heat-treated shaft

Concrete Vibrator, Model 7GVW—5-hp; speed: 7,500-10,000 vibrations per minute; rugged shaft, housing and big 20" vibrator head. From a complete line of air, electric or gasoline-driven vibrators with a wide range of head sizes.



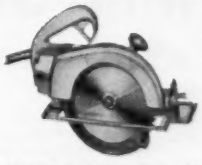
Planer, Model 3P—Sealed transmission and bearings; 3" width; depth adjustable, 0-¼"; full-grip rear handle with trigger switch; 8.4 amp, AC/DC motor. Speed: 13,500 rpm.

Pneumatic Chain Saw, Model 2P—Heavy-duty; 18", 24" or 30" bar; roller bearing nose for fast cutting, longer bar life; automatic motor oiler; trigger throttle in hand grip.



Electric Drill, Model 125—½" capacity; geared key-type chuck; 5-amp motor; removable auxiliary handle; ball and needle bearings; weight: 8½ lbs.; free speed 500 rpm.

Powerful, rugged, easy to handle—Remington Power Tools help you boost output and ease the tough jobs. They're precision-built for long service and minimum maintenance. Your Remington distributor stocks and services the industry's widest selection of power tools and parts.



Electric Saw, Model 108—10" blade; 13-amp motor with powerful worm drive; cuts full 3½"; complete with combination blade, wrench and steel carrying case.

Power Trowel, Model TG4-36—2¼-hp, 4-cycle, gasoline-powered engine; 36" ring size; automatic-recoil starter; centrifugal clutch disengages at idle; safety throttle control.

CHOOSE THE POWER MOST EFFICIENT FOR YOU. REMINGTON POWER TOOLS ARE AVAILABLE IN **AIR · ELECTRIC · GASOLINE-DRIVEN MODELS**

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"HATFUL of SAFETY"

ONE SIZE FITS
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Comfortable, Form fitting

Full Head Protection with Incomparable Comfort

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- S-section edge — no distortion.
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- Fully tested and approved.

NO METAL PARTS for Real Wearing Comfort

7 COLORS: White, Gray, Red, Yellow, Green, Blue, Brown (molded-in, permanent abrasion-proof).

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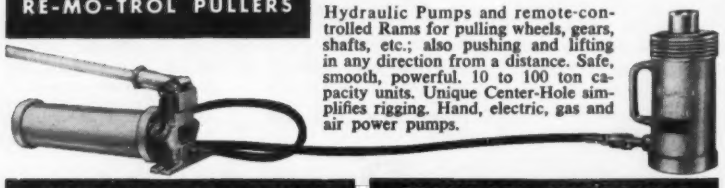
CHESTER, PENNSYLVANIA

The WORLD'S LARGEST MANUFACTURER of SUPERIOR PROTECTIVE EQUIPMENT

Push, Pull or Lift Safely with SIMPLEX
HYDRAULIC EQUIPMENT

RE-MO-TROL PULLERS

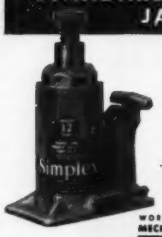


Hydraulic Pumps and remote-controlled Rams for pulling wheels, gears, shafts, etc.; also pushing and lifting in any direction from a distance. Safe, smooth, powerful. 10 to 100 ton capacity units. Unique Center-Hole simplifies rigging. Hand, electric, gas and air power pumps.

JENNY "CENTER-HOLE" PULLERS

Self-contained Hydraulic Pullers with famous Center-Hole for easy pulling, pushing, lifting. Rugged, versatile; 6 models, 30 to 100 ton capacities.

STANDARD HYDRAULIC JACKS



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Get full information on the most complete industrial line of Hydraulic Jacking and Pulling equipment; write for Hydraulic Bulletin.

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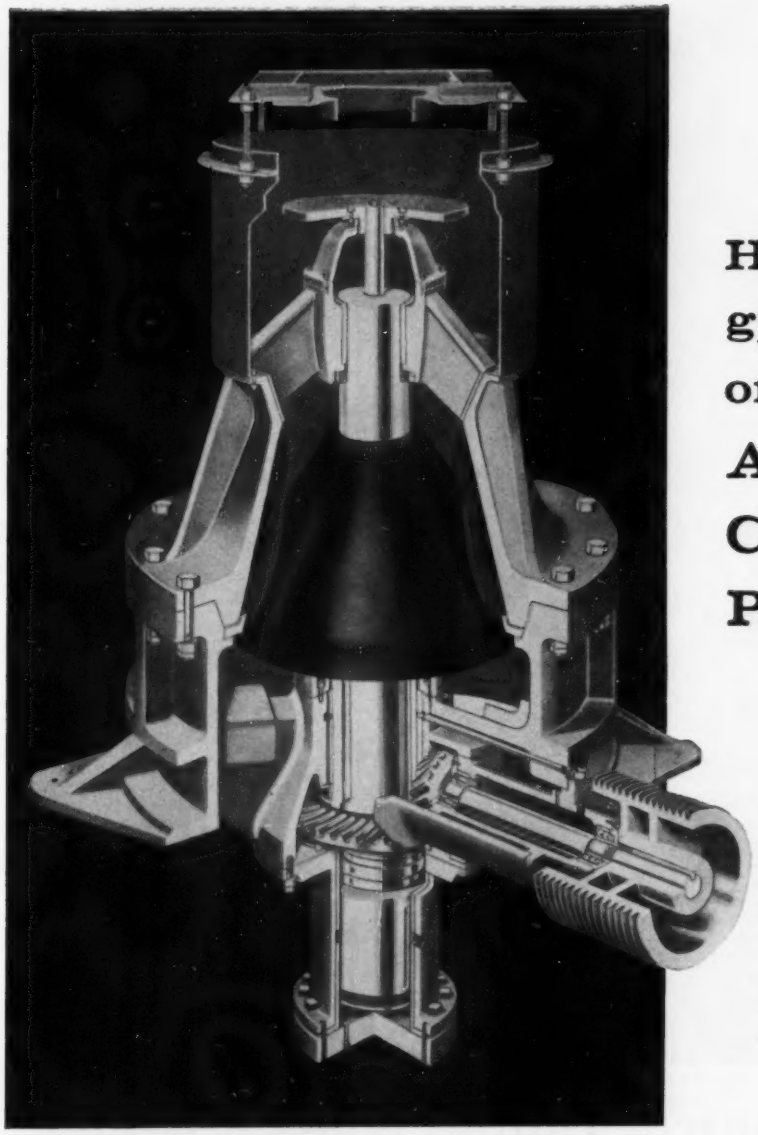
SIMPLEX JACKS

TEMPLETON, KENLY & CO.
2509 Gardner Road, Broadview, Ill.

EQUIPMENT NEWS . . .
continued

the single wire braid hose and up to 1¼ in. for double wire braid hose. To use, the speeder is fitted with the proper size wrench and the socket is inserted and then turned counter-clockwise onto the hose. Then the fitting nipple or stem is inserted in the wrench and screwed clockwise into the socket and hose until a firm grip is obtained. The strap-vise, designed to hold the hose assemblies, is also useful in general shop work for gripping polished tubing, cylinders and similar shapes.—**Parker Fittings & Hose Div., Parker-Hannifin Corp., 17,-325 Euclid Ave., Cleveland 12, O.**

DUMPS OVER SIDE—A side-dump bucket is now available for the No. 977 Traxcavator, the largest crawler-mounted tractor-shovel in Caterpillar's line. The new 2¼-yd bucket allows in-line loading with the Traxcavator without the continual turning demanded of standard tractor-shovels. This reduction in turning time means higher production because cycle time is lowered. It also lowers maintenance because wear is decreased on track parts, and it reduces ground scuffing around the loading area. Prime applications are for stockpiling, trench backfilling, and loading in confined areas. The side-dump bucket can be installed or removed easily by utilizing the same pins, bolts, and nuts that mount the standard bucket. To operate the side dump bucket, the



How a little give adds a lot of life to... AMSCO CRUSHER PARTS

Concave ring and mantle of this *Hydrocone* crusher are made of the toughest steel known . . . Amsco Manganese Steel. It *gives* a little, to take more punishment. *Hydrocone* is a registered trade-mark of the Allis-Chalmers Manufacturing Company.

Both mantle and concave ring crush a lot more feed because of certain properties of Amsco® Manganese Steel. The metal *gives* a little under crushing forces, absorbs stresses, resists cracking and chipping. Yet these same forces work-harden the surface of Amsco Manganese Steel to as much as 500 Brinell . . . a high hardness, stubborn to wear.

Amsco Manganese Steel Crusher Parts maintain their ductile undersurface and work-hardened surface even when worn thin. That's why Amsco parts endure severe abuse for so many work hours without letup.

To be sure of getting Amsco Manganese Steel, order replacement parts from your crusher manufacturer. Amsco makes manganese steel parts for most manufacturers of crushing, grinding and pulverizing equipment.

Amsco also produces other alloy steels with maximum wear resistance under particular service conditions

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

New Flood Control Tunnel Near Boston

Some 40,000 cu yd of medium-hard argillite, with diabasic intrusions, had to be removed in driving a 5266-ft flood control tunnel beneath Malden, Mass., north of Boston. Bethlehem Hollow Drill Steel, 1⅛ in. round, helped to speed the boring of the blast holes.

The 12½-ft-diameter tunnel is being built for the Commonwealth of Massachusetts, Metropolitan District Commission, Construction Division, by Coker Construction Co. The tunnel is about 300 ft below ground level, and at its extremities, connects two vertical shafts. Upon completion, it will divert Spot Pond Brook through an inverted siphon beneath the city.

Bethlehem Hollow Drill Steel keeps costs down in all kinds of rock removal because it stays on the job. Rolled from fatigue-resistant steel, it has a uniform hole which is centrally located in the bar. Bethlehem Hollow has a wide quenching range. And it is easy to heat-treat for the proper balance of toughness and wear-resistance, providing long-wearing threads and strong shanks.

Bethlehem Hollow can be obtained in Carbon and Ultra-Alloy grades in rounds, hexagons and quarter-octagons. It comes regularly in lengths of from 18 ft to 27 ft, though longer lengths can also be furnished. Specify Bethlehem Hollow the next time you need drill steel.

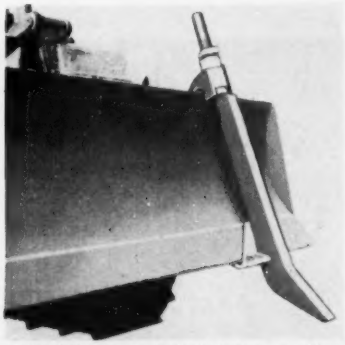
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation.
Export Distributor: Bethlehem Steel Export Corporation

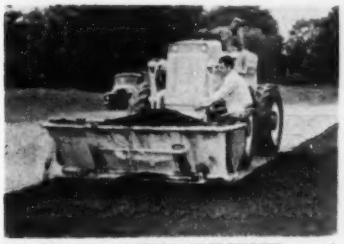
BETHLEHEM HOLLOW DRILL STEEL CARBON AND ULTRA-ALLOY

BETHLEHEM STEEL

operator uses a control level mounted to his right in line with the standard bucket control levers. A valve installed on the hydraulic tank controls the side-dumping motion. — **Caterpillar Tractor Co., Peoria, Ill.**



QUICKLY ATTACHED—A line of ripper teeth that can be mounted quickly on a dozer blade to remove roots or stumps or to break up hardpan, has been introduced by Young Iron Works. Single teeth can be mounted in a few minutes on any make of dozer blade by means of a simple clamp. Five sizes are available. Prices range from $40 to $295.— **Young Iron Works, 2959 1st Ave., S., Seattle 4, Wash.**



LOADER ATTACHMENT — A blacktop spreader attachment for its models HU, HH, and HO Payloader tractor-shovels has been introduced by Hough. The front-mounted spreader, which is quickly interchangeable with the standard loader bucket, provides an economical way to lay down hot or cold mix in strips up to 8 ft wide in a single pass. Thickness of spread can be controlled up to 6 in. All spreader operations are hydraulically controlled. A separate air-cooled gasoline engine provides pressure for the hydraulic motor that drives twin 8-in. augers and the hydraulic control cylinders. — **Frank G. Hough Co., 706 7th Ave., Libertyville, Ill.**

Onan ELECTRIC PLANTS
ELECTRIC PLANT NEWS
Onan ELECTRIC PLANTS

Here's how Onan Portable Power pays you added profits!

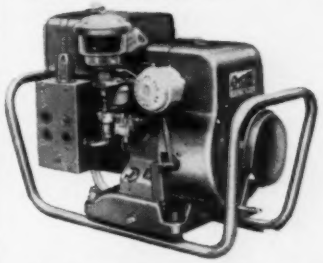
Gives you cost-cutting power on the job . . . *from the start*

Carry, truck or wheel in an Onan and you're all set with plug-in power for the whole crew. No wasting time with hand tools . . . no waiting for utility lines. If you're not using electric power *full time* chances are you're losing more money than the cost of several Onan plants.

4-cycle, season-long dependability

Onan plants are rugged . . . built to take abuse from weather and workmen. Special cast-iron block Onan engine and drip-proof all-climate Onan generator are direct-connected in a rigid, compact, smooth-running unit. Out-perform and outlast "assembled type" plants using general purpose engines. *Special contractor models from 500 to 10,000 watts.*

2500-watt model serves crew of 3!



Model 205AJ-1P, most popular Onan unit with residential contractors. Complete as shown with 4 plug-ins, pilot light, carrying frame, recoil starter . . . ready to run. Dolly-mounted model also available.

New folder helps you choose the right model for your job. Write today!

See your distributor for a free demonstration

D. W. ONAN & SONS INC.

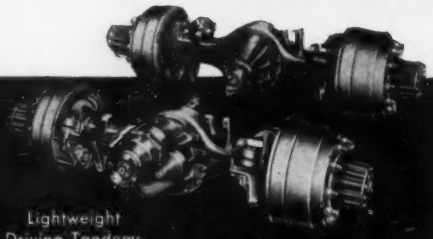
2732A University Ave. S.E., Minneapolis 14, Minnesota

ELECTRIC PLANTS • AIR-COOLED ENGINES • KAB KOOLER • GENERATORS

Onan ELECTRIC PLANTS

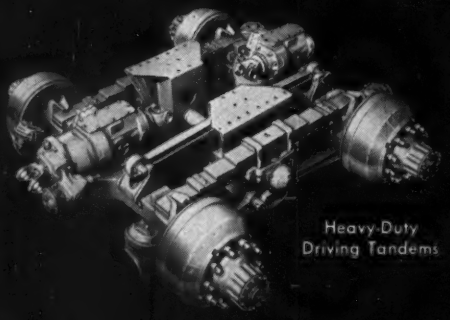
For Today's Most Complete Line of Quality

SPECIFY... TIMKEN-DETROIT®

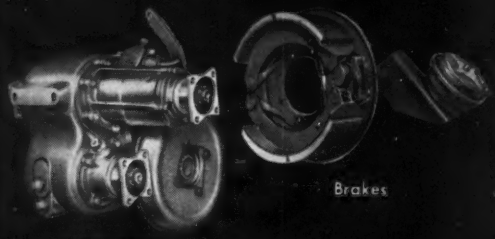


Lightweight Driving Tandems

Trailer Axles



Heavy-Duty Driving Tandems



Brakes

Gear Boxes

Single Driving Axles

Front Axles

Whether your requirements call for highway or off-the-road equipment—Timken-Detroit offers torture-tested axles and brakes proven by almost 50 years of field testing and laboratory research!

Timken-Detroit meets all your requirements for driving, trailer and front axles . . . brakes and gear boxes . . . with a complete range of capacities in each product category. Shown here are some of the units included in the complete line.

Nearly 50 years of manufacturing experience—plus continuing field and laboratory research—have taught Timken-Detroit the exacting needs of the trucking industry. Timken-Detroit Axles and Brakes are designed and built to give you the utmost in service, safety and dependability.

To you—this leadership in power transmission and braking systems means more productive road time, reduced operating costs and lower maintenance expense. Timken-Detroit Axles and Brakes are engineered to carry more payload . . . and stop more payload . . . at lower operating costs under all conditions.

The Timken-Detroit line of Medium and Heavy Duty Double-Reduction Tandems is an example of the superior engineering features and quality built into *every* Timken-Detroit product.

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York
Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

TIMKEN *Detroit* AXLES

TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

Accepted DA Standard

TRADE MARK REGISTERED

Axles and Brakes for Commercial Vehicles

Products of Rockwell Spring and Axle Co.

Timken-Detroit Heavy-Duty Double-Reduction Tandems Give You Payload Leadership!

Ability to take the toughest going and still deliver the load on time has helped make these rugged tandems the number one choice with operators of heavy-duty vehicles. These tandems give you the big advantages of long trouble-free service, economical performance and utmost dependability.

Here are a few of the features developed in famous Timken-Detroit Tandem Drive Units—

"Cradle Ride" Suspension... free ends of long, resilient springs float in axle spring guide brackets. This permits axles to articulate freely, adjusting themselves to road irregularities. Floating springs cradle the vehicle, materially reducing road shock and eliminating source of vehicle flutter. "Cradle Ride" suspension stabilizes the load, permits easy, restful driving . . . improves driver control and safety. Driving and braking forces are transmitted only through torque rods.

Hypoid Gears with their larger pinions and greater tooth contact give you outstanding performance, top efficiency and long life—plus lower maintenance costs.

Inter-Axle Differential divides torque evenly between axles . . . yet permits wheels of one axle to turn faster or slower than wheels of the other axle. This means both axles are always doing equal amounts of work. Driving parts and tires last longer. Controlled from the cab, differential can be locked out at any speed to give positive through drive.

Rectangular Shaped Axle Housings are forged from high carbon steel. This rectangular shape, combined with full strength corner sections, provides the greatest strength possible with minimum weight and size.

Famous Torsion Flow Axle Shafts are made even stronger through the use of more splines and greater root and body diameter.

Dependable Heavy Duty "P" Series Air Brakes with unit-mounted design make a compact self-contained assembly. Temperatures are lower and liner life is longer because of open type spiders. Tapered "Econo-liners" provide greatest thickness in area of greatest wear.

Unequaled parts interchangeability gives you more time on the road—reduces parts inventory—speeds service. Parts are standard items readily available.

WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSSES AND TRAILERS

All the **PIPE PILE**
to help your work move with no delays, no storage problems . . . and with more savings

Economical, lightweight spiral-weld pipe is being used more and more in applications for foundation pile. Easier-to-use, high strength, high bearing load and adaptability are just a few of its excellent advantages — and "Faster-from-Foster" shipments assure prompt deliveries.

Foster contractor service includes welded and seamless Pipe for Piling, in all sizes and wall thicknesses. Depend on prompt shipments from Foster Stocks of Rental Steel-Sheet Piling, H-Pile, Lightweight Piling, Foster Fabricated Rail Pile and Highway Products.

Write or call your nearest Foster office for new Pipe for Piling Catalog No. CM-4.

SINCE 1901
COMPLETE CONTRACTOR SERVICE
PILING • PIPE • RAIL • HIGHWAY PRODUCTS
L.B. FOSTER CO.
PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

Prestressed Concrete—Construction stories of 16 projects throughout the world illustrate a number of applications for prestressed concrete. The 20-p booklet is written to show the part that Pozzolith played on these jobs but it also covers the important construction techniques on these jobs.—**The Master Builders Co., 7016 Euclid Ave., Cleveland 3, Ohio.**

Grinding Concrete—A 4-p bulletin describes the proper accessories and speeds for wet rubbing and dry grinding of concrete. The bulletin describes equipment for finishing hardened concrete walls, floors, and ceilings.—**Bulletin 5727, Stow Mfg. Co., 31 Shear St., Binghamton, N. Y.**

Nordberg Line—A 12-p brochure describes and illustrates each major type of Nordberg machinery. Included are diesel and gas engines, Symons crushers and screen, grinding mills, hoists, kilns, and railway maintenance machines.—**Bulletin 271, Nordberg Manufacturing Company, Milwaukee 1, Wis.**

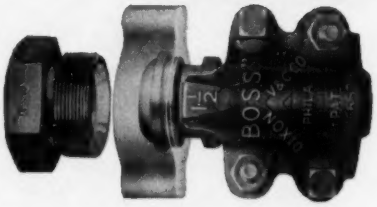
British Welding—"Sif-Tips" is a welding pamphlet published quarterly in England by Suffolk Iron Foundry. It reports on British welding ideas and techniques. For information and subscription rates write to the company editor. — **Suffolk Iron Foundry (1920) Ltd., Stowmarket, Suffolk, England.**

Excavators—The Badger Division has published a 12-p catalog covering the full line of Hopto hydraulic excavators. The line of five models range in size from ⅛ to ½ yd and include truck-mounted excavators and tractor-mounted backhoes.—**The Warner & Swasey Co., Badger Division, Winona, Minn.**

Cellular Cofferdams—TVA has published Vol. 1, "Steel Sheet Piling Cellular Cofferdams on

Safest Connections for Pile Driver Hose
AND OTHER STEAM, AIR, WATER AND HYDRAULIC APPLICATIONS

"GJ-BOSS"
GROUND-JOINT FEMALE COUPLING STYLE X-34



The original *washerless* coupling that is unequalled for *safety* in every high pressure service, and will therefore serve with exceptional efficiency and economy on all low-pressure applications. Built to withstand hard use and rough handling. Ground-joint union between stem and spud provides leak-proof, trouble-free seal...no lost or worn-out washers to replace. All parts malleable iron or steel, thoroughly rustproofed. Furnished with super-strong "Boss" Offset and Interlocking Clamps. Sizes ¼" to 6", inclusive.

COMPANION MALE COUPLING
"BOSS", STYLE MX-16

Companion coupling for "GJ-Boss", described above, and "Boss" Washer Type Couplings Style W-16. Will prove equally efficient and economical for all applications where standard iron pipe nipples are normally used. Each size fits same size hose . . . oversize hose not required. Coupling consists of I.P.T. male stem and "Boss" Offset and Interlocking Clamp. Steel or malleable iron, thoroughly rustproofed. Sizes ¼" to 6", inclusive.

Stocked by Manufacturers and Distributors of Mechanical Rubber Goods

DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO. Associate Companies

C.I.M. FLOODLAMPS are ALL-GLASS, give longer service life, more light, and don't grow dim!

General Electric's new floodlamp for Construction and Industrial Machinery is *all-glass*. This one-piece unit has no gaskets to leak. It is hermetically sealed so that dust, dirt and moisture can't get inside to scatter or dim light. Reflectors and lenses are a special hard glass that won't crack if splattered by rain or snow. There is no inner bulb to blacken—the whole unit is a bulb! Result: G-E C.I.M. Floodlamps *do not* grow dim.

Available in the 12- and 24-volt sizes, these lamps feature *two* single coil filaments *in series* instead of one long filament—and being shorter, the filaments are much stronger. These sturdy filaments are not welded to the lead-in wires . . . instead, they are clamped in a vise-like grip for added resistance to breakage. So filaments *stay* in focus.

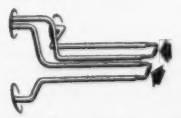
What does this mean for you? It offers rugged-duty floodlamps that, when used in shock-mounted housings, will give a broad-beam spread, both vertically and horizontally, through any weather, for use on bulldozers, graders, scrapers, crawlers, or other road-building, mining and construction machinery.

General Electric makes a full line of all-glass sealed beam lamps for Construction and Industrial Machinery. Contact your nearby G-E Lamp Distributor or write: General Electric Co., Miniature Lamp Dept. CEM-48, Nela Park, Cleveland 12, Ohio.

SPECIFICATIONS FOR G-E C.I.M. FLOODLAMPS

(PAR-46 Bulbs—2 contact lugs—5¾" dia.—500 hours designed life)

G-E No.	Circuit Volts	Watts
4478	12	60
4578	24	60



Two single coil filaments in series for greater strength

Vise-like grip adds resistance to filament breakage

Progress Is Our Most Important Product

GENERAL ELECTRIC

your

two

best

friends...

"the man ahead"

and

"the man behind"

That man just ahead of you hopes you'll take his job away from him. He's plain selfish about it . . . that way you push him up the ladder, too.

The fellow right behind you, what about him? He's another good friend. Just help make him more capable of capturing your present spot . . . see, now he's pushing you!

How can you serve yourself better than you ever have before? By upgrading your own job performance. By learning all you can about other functions of your company's business. By putting today's problems together with tomorrow's promises . . . and becoming more and more knowing about both, right here in the high-utility pages of this one specialized publication.

This, don't ever forget, is your own magazine — for you and men like yourself to work things out together — to find new and better ways to make progress and profits. McGraw-Hill editors, who live on your street, unceasingly strive to make it the single greatest community of interest for your industry. And the more effort they put into it, the easier it is for you to get more out of it for every reading minute invested.

Look ahead, read ahead, get ahead. Live this secret. Share it. After you've read this issue so satisfyingly, hand it over to that man one step below. Show him how much there's in it for him, too. A few issues from now, we'll bet he looks you in the eye and says, "Thanks, friend. I just got my own subscription."

McGRAW-HILL SPECIALIZED PUBLICATIONS

The most interesting reading for the man most interested in moving ahead

NEW PUBLICATIONS...
continued

Rock" of its Technical Monograph No. 75, "Construction Plant for TVA Projects." The 281-p volume covers planning, design, construction and removal of sheet piling cofferdams on TVA projects on the Tennessee River. Price $2.50.—**TVA Treasurer's Office, Knoxville, Tenn.**

Concrete Pipe—Price Bros. Co. has published two new booklets. "Concrete Pressure Pipe Laying Instructions" includes size and deflection tables, laying, jointing and bedding procedures, and a check list of supplies and equipment. "The Story of Concrete Pressure Pipe" covers pipe manufacturing, characteristics of this pipe, and a catalog of sizes and specifications.—**Price Bros. Co., 1932 E. Monument Ave., Dayton 1, Ohio.**

Jet Quarrying—A 12-p booklet "Application of the Rocket Jet to Mining and Quarrying" describes how a rocket-type flame can produce blastholes, channels in stone quarries, and shaped stone.—**Linde Co., 30 East 42nd St., New York 17, N. Y.**

Worthington Products—Two more models, the 7M and the 10M, in a completely new line of contractors pumps are available and are described in one-page data sheets. The first model in the line, the 4M, came out several months ago. Bulletin 6505 BIP describes two new lines of concrete truck mixers produced by the Concrete Machinery Division. —**Worthington Corp., Harrison, N. J.**

Steel Joists—An 8-p booklet gives design properties for J&L's 10-in. and 12-in. joist sections, junior beams, junior channels, and light beams. The booklet can be inserted in the American Institute of Steel Construction Manual.—**Public Relations and Advertising Department, Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.**

Laminated Timber—"Structural Glued Laminated Construction" gives a full description of permanently bonded built-up timbers for all types of construction. Included are articles on the history of the process, fabrication,

GUARANTEED
unconditionally against breakage!
CROSBY-LAUGHLIN
Load-Rated Trademark
HOOKS

Greater safe working loads—the highest guaranteed capacity *per size*—are offered by Crosby-Laughlin* "Load-Rated" Hooks. Proved design and new alloys —drop forged and heat treated—increase capacities by 50% with no increase in weight! This complete line gives you capacities from ¾ to 150 tons—is unconditionally guaranteed against breakage. Every "Load-Rated" hook with drilled cam converts quickly to a safety hook. Demand the "RED fittings," symbol of quality and the world's most complete line of drop forged fittings. *New catalog* has detailed specifications on over 2000 items. Available from construction, industrial and mill supply distributors. Or write:
*Trademark

CROSBY-LAUGHLIN *Division*
AMERICAN HOIST & DERRICK COMPANY
FT. WAYNE 1, INDIANA

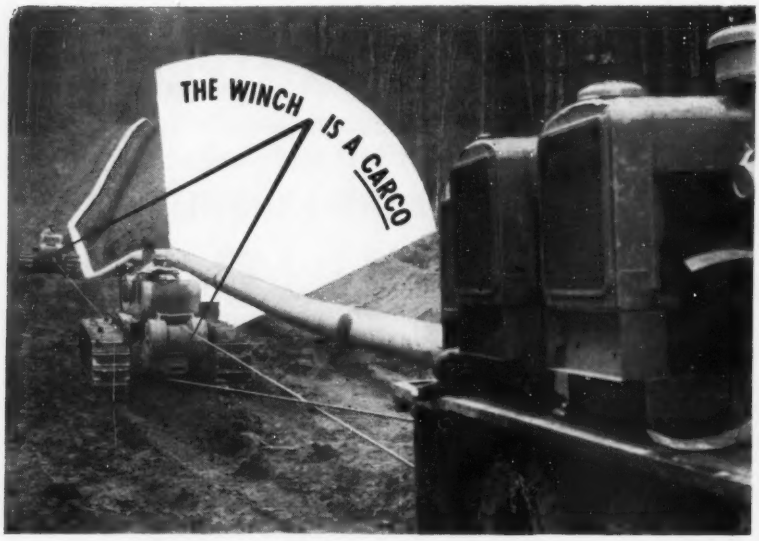
Free Buyer's Guide ON TROWELERS

A few years ago, a troweler was a troweler or a "finisher." —Choice was limited to "big" or "little." Today, there's a wide selection to suit your requirements. *White*, first with retractable wheel trowelers, also makes stationary ring models. Sizes range from 28" to 48". Before you buy, it will pay you to know about the two different types, three different sizes.

White

See all five models at your nearest distributor or write direct for free Buyer's Guide

White Manufacturing Company, Elkhart 6, Indiana



CARCO WINCHES' PROVEN DEPENDABILITY HELPS KEEP PIPELINE JOB ON SCHEDULE

The use and performance of Carco winches on numerous heavy construction and pipeline projects similar to your own jobs are the most reliable measure of both their value to you and their dependability.

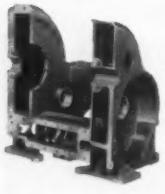
Today, most contractors in tackling heavy construction and pipeline jobs find it pays to include one or more Carco winches as part of their equipment . . . and this includes the nation's largest and most efficient operators.

The River Construction Corporation of Fort Worth, Texas, for instance, used six Carco Model G winches on International TD-18's and one Carco Model J winch on a TD-24 in completing schedules 18 and 19 of the Pacific Northwest pipeline.

Working on grades up to 55 per cent, Carco winches towed up, held and lowered the heavy sideboom tractors that kept the pipe in position for welding, towed and lowered the welders and performed a multitude of other services that kept the job moving and helped keep costs within estimated figures.

Put Carco winches to work on your jobs. Based upon their rugged towing and hoisting power and their quality construction, they are relatively inexpensive . . . and they will cut your machinery investment by eliminating, in many instances, the need for larger, bulkier and more costly equipment.

See your nearest Carco dealer. You will find him an equipment specialist, able to help you select the model you need. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Wash. Branch at Chicago, Ill.



Carcometal case, smooth and streamlined, seals out dirt, dust and water to protect gears which operate in a continuous oil bath.

An automatic brake, available at added cost, prevents load drop or slip-back by taking effect the instant tractor clutch is disengaged.

Carco winches have earned the confidence of contractors everywhere. As a result, Carco makes more winches for more makes and models of industrial tractors than other producers.

CARCO®

NEW PUBLICATIONS...
continued

fire-resistance, and a list of companies who design and build these members. — **Koppers Co. Inc., Chemical Division, 801 Koppers Bldg., Pittsburgh 19, Pa.**

Masonry Walls—The following three publications provide useful information for masonry contractors. "Type of Workmanship Recommended to Secure Dry Brick Walls"; "Type of Workmanship Recommended for Concrete Block Walls"; "Specifications Recommended to Secure Dry Brick Walls."—**Louisville Cement Co., Louisville, Ky.**

Universal Machines — Bulletin 406-581 describes the Universal patented, power-lift portable conveyor. The conveyors operate at 5 to 15 hp, and move material 300 ft per min at an angle of 20 deg. Bulletin 804-571 covers a new horizontal vibrating screen called the "Screen Master."—**Universal Engineering Corp., 625 "C" Ave. N. W., Cedar Rapids, Ia.**

Culvert Handbook—A complete line of galvanized corrugated metal culvert pipe and accessories and ordering information is covered in a 28-p booklet WC-233.—**Wheeling Corrugating Co., Wheeling, West Va.**

Pipe Piles—A 24-p booklet describes Foster's Taylor Forge spiral-weld foundation pipe piles. In addition to detailed specifications, the booklet describes a number of pipe-pile installations and includes typical driving logs. —**L. B. Foster Co., P. O. Box 1647, Pittsburgh 30, Pa.**

Demolition Tools—A 24-p bulletin by Ingersoll-Rand covers the company's complete line of digging tools and accessories. It covers 16 variations of tools and 64 accessories. — **Form 4190, Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.**

Trowel Trade Tools—The 1958 Goldblatt tool catalog lists hundreds of tools and accessories for plaster and concrete work. Included in the 84-p booklet are hand and power trowels, screeds, brushes, grinders, jointing tools, levels, jacks and scaffolds.—**Goldblatt Tool Co., 1910 Walnut St., Kansas City 8, Mo.**

Introducing the New 1958
RODGERS TRACK PRESS

RODGERS STATIONARY TRACK PRESS
Model 28TP-1

Patents Applied for

The Safest and Fastest operating press ever... To service all makes of crawler tracks

Disassemble a pair of links with grouser (2 bolts removed) in a matter of seconds—in one continuous operation.

Less handling of track components. No broaching of track links.

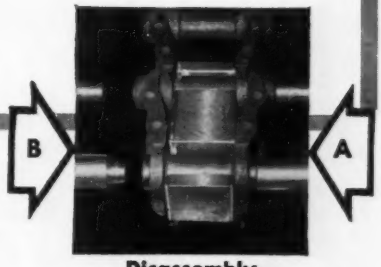
Assemble a pair of links with grouser (2 bolts removed) precisely spaced in one operation in a matter of seconds.

Precise spacing of links thru positive stops on rams—quickly adjustable.

Single pin and bushing can be removed at any point in the track without dismantling track to that point.

IMPORTANT FEATURES

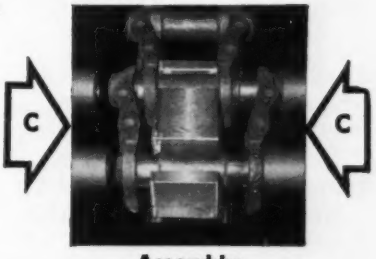
- Press capacity 150 tons. Press operation completely power controlled.
- Retractable jaws for faster positioning of the track for pressing operation.
- Power winch (5,000 lb. pull). Power drive for movement of track in either direction.
- Your choice of Stationary Models or Trailer Models equipped with air or water cooled gasoline engine.
- Trailer Models equipped with air compressor (72 CFM at 100 PSI) to operate impact air wrench and other air tools.
- Low cost tooling to service all makes and models of track.



Disassembly

A. Ram at right forces pin and bushing out of link.

B. Ram at left forces pin and bushing out of link for complete disassembly.



Assembly

C. Both left and right rams simultaneously force both links on pin and bushing to complete the assembly in a matter of a few seconds.

For complete information write for track press catalog 334.

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Cut Wheel Bearing Damage

MECHANICS who adjust wheel bearings by relying on their sense of "feel," or who depend on visual inspections to spot water-contaminated grease, can cut spindle and wheel bearing wear by developing better adjustment and relubrication procedures.

That's been the experience of engineers of the Timken-Detroit Axle Division of Rockwell Spring and Axle Co. They point out that like all highly finished carburized steel products, wheel bearings are extremely susceptible to attack by water. And because of the job wheel bearings perform it is virtually impossible to keep water from them for long.

Water enters a wheel bearing cavity in one of two ways: It gets past ineffective seals when a rig is working in rain or over wet ground; and it builds up from the condensation of vapor resulting from repeated breathing.

Breathing is caused by changes in barometric pressure or temperature resulting from weather variations. Changes that cause condensation also occur every time a machine is put to work or shut down. For this reason, it is impossible to prevent breathing.

In many instances, breathing builds up enough water to damage bearings without producing noticeable changes in the bearing lubricant. Long before contamination shows up to the naked eye, bearing damage can occur in the form of hairline marks on rollers and races. When this happens, the next step is pitting and flaking that ruins bearings.

Good steels are made up of millions of tiny particles closely bonded together. The gray or black stains called water etch that appear first on deteriorating bearings occur when water literally removes the adhesive holding these particles together. When this happens, liberated particles accelerate wear on all bearing parts. This wear becomes fatal when freed particles work between rollers and mating parts.

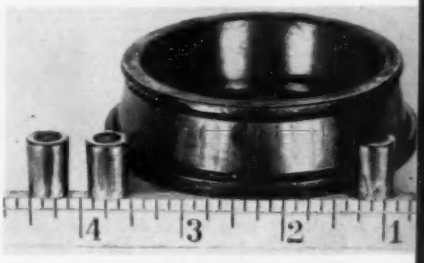
In no time, the rolling action of the bearing is retarded and this increases the creeping action of the loosely fitted inner race. When creeping becomes substantial, it causes wear on spindles and journals.

Water - contaminated grease must be removed completely from wheel bearing cavities before it begins this chain of damage. The best way to remove old grease is with kerosene or diesel fuel solvents and a stiff brush. Gasoline and heated solvents are not recommended by Timken-Detroit, and steam cleaning particularly should be avoided.

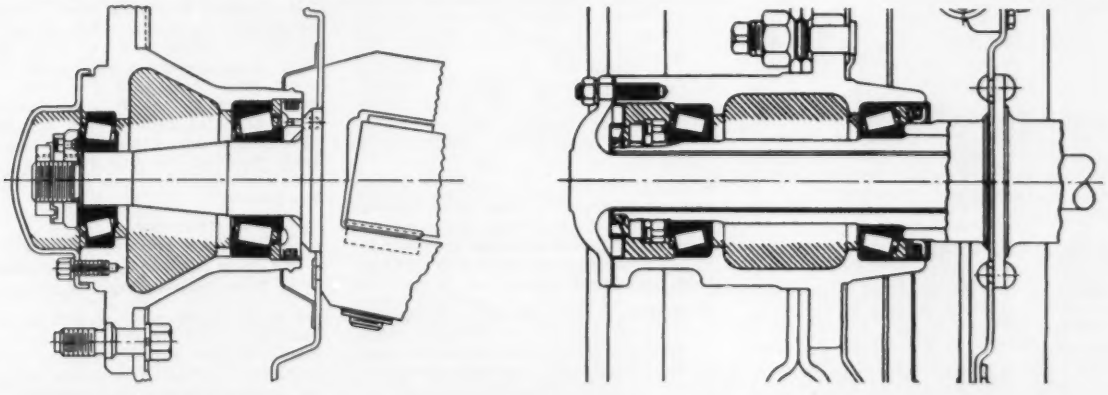
To repack bearings, force new

continued on page 255

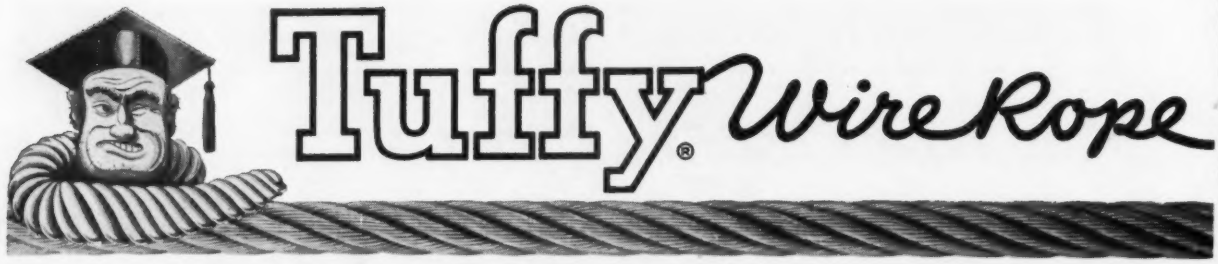
DANGER SIGNAL—First signs of wear are hairline marks on rollers and race that have been exposed to contaminated grease.

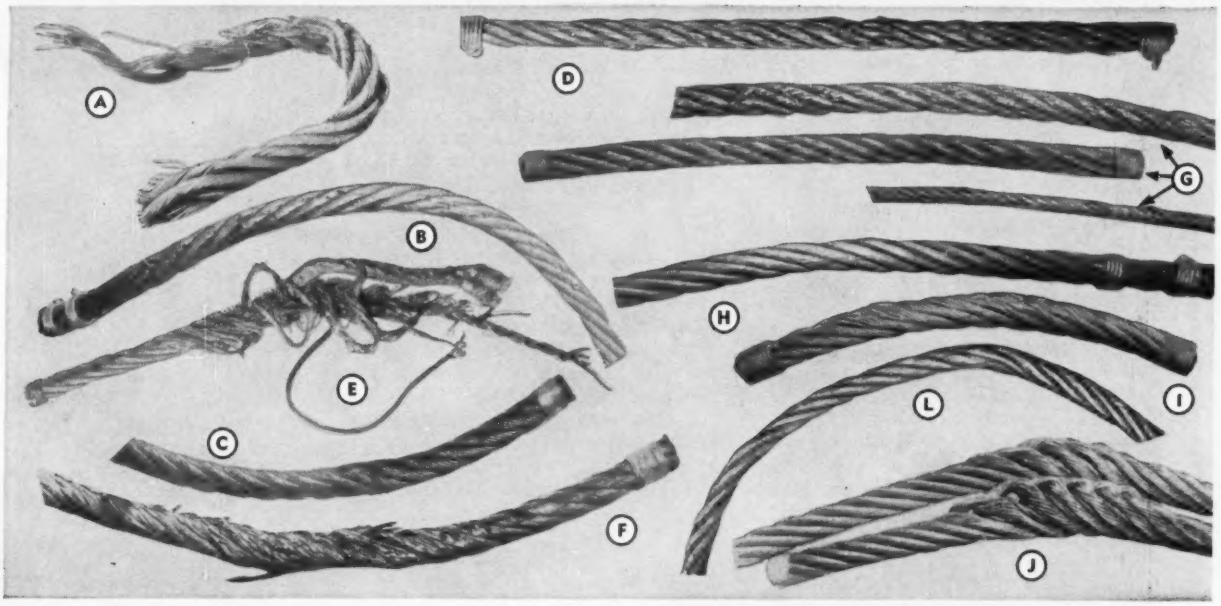


BADLY ETCHED—Rollers and race suffering from advanced stages of water etch are now susceptible to flaking and pitting.



HOW TO REPACK—Typical front and rear wheel hub assemblies are shown in above drawings. To repack bearings, force new grease into all cavities between rollers and roller cages. Shadings in drawings show amount of grease needed for good protection.





Guard Against these Cripplers and Killers of Wire Rope

Pictured above are some of the results of wire rope abuses. They quickly ruin wire rope efficiency or end rope life abruptly, long before you have had the service you paid for. Even the best wire rope is a sitting duck for these enemies. When you avoid or minimize them, you make real gains in longer rope life, better service and greater economy. Remember, your Tuffy distributor will be glad to work with you against these and other wire rope hazards.

Here are the "case histories" of the untimely wire-rope fatalities and injuries shown in the picture:

A. Mangled in a wedge socket: Here's a result of improper socketing. It was caused by using a poorly designed or worn-out wedge socket. Failure at the dead end can damage other sections of the rope, too.

B. Rusty road to ruin: Rust—No. 1 enemy of steel—takes a heavy toll in wire rope life. An insidious, silent type of killer, rust often does irreparable damage before it's even noticed. The one-strand break shown here resulted when the rope was allowed to become rustbound through lack of lubrication. Tests show that, with other conditions ideal, properly lubricated rope has up to 10 times the life expectancy of dry rope.

C. The crushing blow: The Sunday punch for this piece of wire rope was delivered by a tractor cleat—just one of many crushing injuries caused by rope being run over or banged into by hard, sharp objects. Even the toughest wire rope is no match for this kind of mistreatment.

D. Strangled by a misfit: When the bearing surface of a sheave is too small for the rope diameter, pinching action quickly destroys the rope — especially when it's overloaded. The victim shown here was knocked out in just 1½ hours of service.

E. Apparent suicide: This rope jumped out of sheave and was soon destroyed by pulling around the shaft. Actually it was a case of sudden slack which threw the rope out of the sheave.

F. End of the line came quickly for this rope as the result of operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope. Sheaves should be checked thoroughly and often.

G. Victim of the "bends": Excessive bending of wire rope accelerates wear. Generally, more flexible ropes are used as bending stresses increase (with decrease in tread diameter of sheave or drum). If a rope is operated on a sheave too small for its bending characteristics, early failure is certain. Through an exhaustive series of bending tests, Union Wire Rope engineers have compiled data that you can use to assure getting the rope construction that will give you the longest service life. Ask about it.

H. On the "blink" from a kink: This open kink resulted from mishandling of rope. Guard against kinks by proper winding on the drum. Never pull a loop smaller. Always enlarge it, then straighten out the rope.

I.-L. Crushed and worn from "beatings on the drum": Even under normal operating conditions, drum wear gives wire rope severe punishment. This wear concentrates at the cross-over points and at the flange. Excessive drum crushing results from operating on small drums, excessive loading and poor winding. Smooth drums are not recommended. Here are typical "drum beatings":

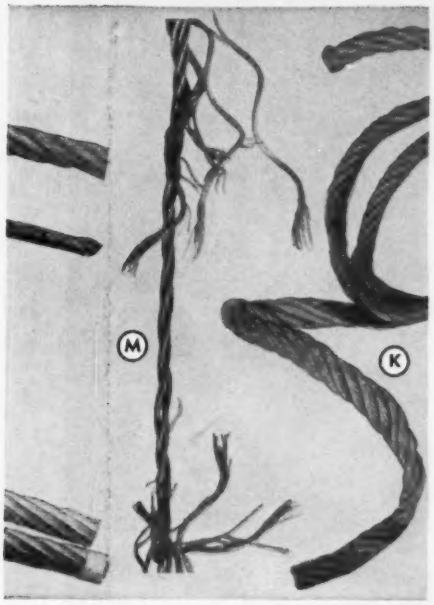
- **I. Cross-over wear.**
- **J. Cross-over crushing on drum.**
- **K. Drum crushing from poor winding.**
- **L. Drum-crushing from small drum.**

Although drum wear cannot be eliminated, its effects can be greatly reduced. Under properly engineered procedures, two and three times the service can be obtained from the same line by improving drum conditions. Union Wire Rope engineers will help you with this problem. Get in touch with us for more information.

58-1

Tips

Be Sure You Use BALANCED Wire Rope



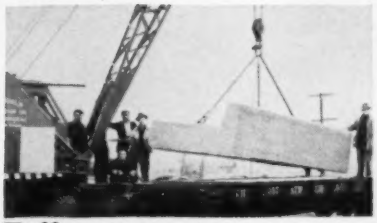
M. Overloaded — soon exploded: The rated capacity of a wire rope is based on the breaking strength (catalog) divided by a safety factor applicable to the type of service or use. The grade of steel, type of construction and size of the rope determine tensile strength. It must be properly related to the loads it will carry, or costly and dangerous early failures are likely to occur.

You hear a lot about extra strength in wire rope. There is no trick to designing wire rope with very high strength. But — there is nothing to be gained if high strength is put in to the exclusion or subordination of other qualities that are just as important as excessive strength.

For example: the life of a dragline depends on its resistance to abrasion. When it breaks, as a result of continued exceptionally hard digging in abrasive materials, the owner finds maintenance cost of the dragline increasing. Hard-drawn rope tends to act as a spring. As wear progresses, it arches over the crown of the strand. Repeated flexing of this too-strong arched wire causes early failure. So the drag rope must meet a condition where strength is not the major factor in resisting abrasion.

Every one of the Tuffy Special Purpose Ropes has a different ratio of strength to other properties necessary for longest life, most efficient operation and lowest maintenance expense. Your Union Wire Rope distributor has the BALANCED rope for every application.

Tuffy Special-Purpose Ropes are tailored & BALANCED for special uses



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Tuffy BALANCED Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built and balanced to take the beating of drum-crushing abuse.

Tuffy BALANCED Dozer Rope

Built to give you longer service with less downtime. 150' reels of 1/2" or 9/16" mounted on your dozers allow you to cut off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!

Tuffy BALANCED Dragline Rope

Made to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves; hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

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How Your Tuffy Distributor Can Help You Save Money

Condition of equipment is a big factor in longer rope life and greater economy. Your Tuffy distributor will help you check your equipment and operating conditions to make sure everything is in your favor for getting greatest service from your wire rope. Get in touch with him. And ask him to put your name on his mailing list for FREE Tuffy Educational Bulletins.

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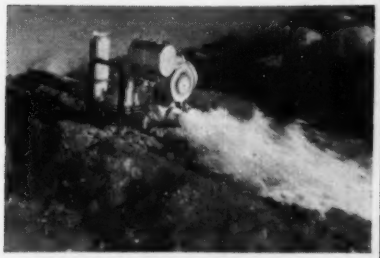

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MAINTENANCE SHOP . . .

continued from page 251

grease into all the cavities between rollers and roller cages. Make sure that cavities adjacent to the bearing and the hub cap also are packed with grease. The lubricant should be on a level with the smallest diameter of the bearing cups or outer races.

Proper wheel bearing adjustment also has a great effect on the life of bearings. Most mechanics agree that the ideal bearing adjustment would be one that imposed no pre-load on the bearings, and at the same time did away with all end-play. But both human and mechanical factors make it impossible to achieve this adjustment with regularity.

Timken-Detroit finds that a small amount of end-play is preferable to a slight amount of preload. Bearings with end-play of from .001 to .010 in. will have a longer life expectancy than bearings with a slight preload.

Timken-Detroit's adjustment recommendations, which do not depend on the mechanic's sense of "feel," follow:

1. Assemble bearings and hub on the axle sleeve or steering knuckle spindle and install the thrust washer if one is required.

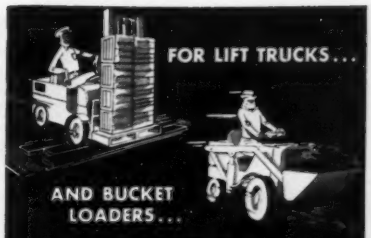
2. Screw the wheel bearing adjustment nut against the bearing or thrust washer as the wheel revolves.

3. Tighten the adjusting nut to 50 lb ft torque while the wheel rotates. Rotate the wheel in both directions to position bearings.

4. Back off the adjusting nut. For axles that have only a single nut, back off the nut one-sixth to one-fourth turn and lock it in place. For axles with double nut and lock construction, back off adjusting nuts one-fourth to one-third turn.

5. Assemble the nut lock washer and tighten the jam nut. For assemblies with a bending-type lockwasher between the adjusting nut and jam nut, torque limits are 100 to 150 lb ft for 1⅛ to 2⅝-in. nuts; and 100 to 200 lb ft for nuts larger than 2⅝ in. For assemblies with a doweled adjusting nut and pierced wheel bearing nut lock, torque limits are 200 to 300 lb ft for 1⅛ to 2⅝-in. nuts; and 250 to 400 lb ft for nuts larger than 2⅝ in.

6. Cotter pin the nut or bend the wheel bearing nut lockwasher over adjusting and jam nuts.



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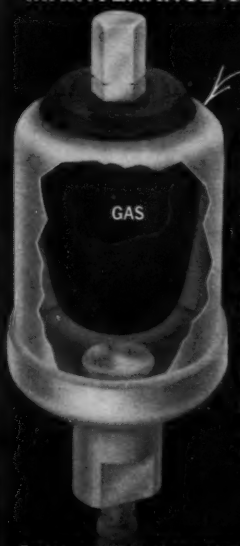

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Number of copies of this issue printed 50, 372

A

Alemite Div. Stewart Warner Corp. 232-233
Allis-Chalmers (Construction Machinery Div.) 121, 122-123, 124
(Engine-Material Handling Div.) 177
Allison Div. General Motors Corp. 142
Alloy Rods Co. 229
Aluminum Co. of America 172
American Bridge Div. U. S. Steel Corp. 76-77
American Chain & Cable Co., Inc. (Wright Hoist Div.) 234
American Hoist & Derrick Co. 147
(Crosby-Laughlin Div.) 247
American Manganese Steel Div. American Brake Shoe Co. 239
American Oil Co. 189
American Steel & Wire Div. U. S. Steel Corp. 169
Atlas Copco AB 226
Austin-Western, Const. Equip. Div. Baldwin-Lima-Hamilton Corp 186-187

B

Baldwin-Lima-Hamilton Corp. (Lima Construction Equipment Div.) 135
Barber-Greene Co. 98
Barco Mfg. Co. 215
Bay City Shovels, Inc. 164
Bay State Abrasive Pdts. Co. 220
Bethlehem Steel Co. 222, 240
Blaw-Knox Co. (Construction Equip. Div.) 63
Boston Woven Hose & Rubber Co. 230
Brainard Steel Div. Sharon Steel Corp. 117
Broderick & Bascom Rope Co. ..... 2nd Cover
Browning Mfg. Co. 44
Bucyrus-Erie Co. 95
Butler Bin Co. 133

C

Case Co., J. I. (Industrial Div.) 33, 34-35, 36
Caterpillar Tractor Co. 43, 46-47, 89, 90-91
(Engine Div.) 100-101
Chevrolet Div. General Motors Corp. 38-39
Cities Service Oil Co. 30-31
Clark Equipment Co. (Automotive Div.) 161
(Construction Machinery Div.) 50-51, 53 55
(Industrial Truck Div.) 193
Cleaver-Brooks Co. (Road Machinery Div.) 200
Cleveland Trencher Co. 127
Clevite Service Div., The Cleveland Graphite Bronze Co. 111
Clipper Mfg. Co. 62
Clyde Iron Works, Inc. 28

D

Dayton Sure-Grip & Shore Co. 220
Deere Industial Div., John 12
Delco-Remy Div. General Motors Corp. 118-119
Dixon Valve & Coupling Co. 244
Dodge Div. Chrysler Corp. 235

E

Earnest Machine Products Co. 180
Eaton Mfg. Co. (Axle Div.) 56
Eimco Corp., The 221
Electric Steel Foundry Co. 16-17
Esso Standard Oil Co. 109
Euclid Div. General Motors Corp. 2, 182-183

F

Fibre-Metal Pdts. Co., The 238
Firestone Tire & Rubber Co. 152
Ford Motor Co. (Ford Div.) 206-207
(Tractor & Implement Div.) 106-107
Foster Co., L. B. 244
Fuller Mfg. Co. 225

G

Galion Iron Works & Mfg. Co. 168
Gates & Sons, Inc. 228
General Electric Co. (Lamp Div.) 245
GMC Truck & Coach Div. General Motors Corp. 218-219
General Tire & Rubber Co., The 66-67
Goodall Rubber Co. 224
Goodrich Aviation Pdts., B. F. Div. of B. F. Goodrich Co. 148
Goodrich Industrial Pdts. Co., B. F. 78
Goodrich Tire Co., B. F. Div. of B. F. Goodrich Co. 1
Goodyear Tire & Rubber Co. (Industrial Pdts. Div.) 15
Gradall Div. Warner & Swasey Co. 5
Greer Hydraulics, Inc. 255
Griffin Wellpoint Corp. 60
Gulf Oil Corp. 69, 70-71, 72

H

Hartford Fire Insurance Company Group 145
Hartford Machine Screw Co. Div. of Standard Screw Co. 48
Heltzel Steel Form & Iron Co., The 178-179
Hercules Powder Co. 198
Homelite Div. Textron, Inc. 254-255
Hough Co., Frank G. 18-19

I

Illinois Gear & Machine Co. 97
Ingersoll Rand Co. 112
International Harvester Co. (Const. Equip. Div.) 157, 158-159, 160
(Drott Div.) 209
(Farm Equipment Div.) 29
Iowa Mfg. Co. 213

J

Jackson Mfg. Co. 199
Jackson Vibrators, Inc. 227
Jaeger Machine Co. 22, 114
Johns-Manville 128-129

K

Koehring Co. (Koehring Div.) 59
(Kwik-Mix Div.) 58

L

LaCrosse Trailer Corp. 115
Lehigh Portland Cement Co. 110
Leschen Wire Rope Div. H. K. Porter Co. Inc. 212
LeTourneau-Westinghouse Co. 74-75
Lincoln Engineering Co. 52

M

Mack Trucks, Inc. 136-137
Macwhyte Co. 3
Mall Tool Co. Div. of Remington Arms Co. 237
Manitowoc Engineering Corp. 141
Marquette Mfg. Co., Inc. 132
Massey-Ferguson Industrial Div. Massey-Harris-Ferguson, Inc. 23, 24-25
Mayo Tunnel & Mine Equipment 228
McKiernan-Terry Corp. 234
Miller Electric Mfg. Co., Inc. 126
Miller Tilt-Top Trailer Co. Inc. 134
Moretrench Corp. 131
Motorola Communications & Electronics, Inc. 217

N

Nordberg Mfg. Co 8-9
Northwest Engineering Co. 7

O

Oliver Corp., The 205
Onan & Sons, Inc., D. W. 241
Owen Bucket Co. 196

P

Pacific Car & Foundry Co. (Tractor Equipment Div.) 248
Patent Scaffolding Co., Inc. 73
Perfect Circle Corp. 194
Porter Co., Inc., H. K. (Leschen Wire Rope Div.) 212
Precast Building Sections, Inc. 223
Prescon Corp., The 154
Pure Oil Co., The 49

Q

"Quick-Way" Truck Shovel Co. 65

R

Radio Corp. of America (Communications Pdts.) 165
Raybestos-Manhattan, Inc. (Manhattan Rubber Div.) 162-163
Richmond Screw Anchor Co., Inc. 37
Rockford Clutch Div. Borg-Warner 223
Rodgers Hydraulic, Inc. 249
Rome Plow Co. 216

S

Safway Steel Products, Inc. 211
St. Paul & Tacoma Lumber Co. 21
Sinclair Refining Co. 201
Skil Corp. 185
Smith & Co., D. B. 234
Snap-on Tools Corp. 210
Standard Dry Wall Products 197
Standard Oil Co. of California 45
Stang Corp., John W. 155
Stoody Co. 94
Stow Mfg. Co. 6, 231
Superior Concrete Accessories, Inc. 236
Svenska Motorborr AB 108
Symons Clamp & Mfg. Co. 26

T

Templeton, Kenly & Co. 238
Texas Co. 10-11
Thermoid Co. 175
Thew Shovel Co. 27
Timken-Detroit Axle Div. Rockwell Spring & Axle Co. 242-243
Timken Roller Bearing Co. ..... 4th Cover
Travelers Insurance Companies, Inc. ..... 3rd Cover

U

Union Wire Rope Corp. 252-253
United States Rubber Co. (Mechanical Goods Div.) 40
(U. S. Royal Nylon Tires) 250
Universal Atlas Cement Co. 105

V

Van Brush Mfg. Co. 228
Vermeer Mfg. Co. 214
Vibro-Plus Pdts., Inc. 32
Visking Co. Union Carbide & Carbon Corp. 151

W

Warner & Swasey Co. (Gradall Div.) 5
Water Seals, Inc. 20
Waukesha Motor Co. 54
White Instruments Co., David 214
White Mfg. Co. 247
Whiteman Mfg. Co. 173
Whitney Chain Co. 99
Wood Co., John (Bennett Pump Div.) 199
Wright Hoist Div. American Chain & Cable Co., Inc. 234

Y

Yale & Towne Mfg. Co., The (Contractors Machinery Div.) 190

CLASSIFIED ADVERTISING

F. J. Eberle, Business Manager

Business Opportunities 256
Employment Opportunities 256
Equipment (Used or Surplus New) For Sale 256

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Methods Memo . . .

For Civil Defense

C. N. Flagg Co., Inc., pipeline contractor of Meriden, Conn., is backing Connecticut's civil defense program with a pledge to make available the firm's equipment and manpower in an emergency.

Peter Flagg, president of the company, says the pledge covers 286 machines worth about $1 million. The photo shows him placing a civil defense emblem on one rig while the state's Director of Civil Defense looks on.

Flagg and three other officials of the firm also took oaths as civil defense aids. All of the firm's 500 employees will take the civil defense pledge.

C. N. Flagg Co. is one of the largest pipeline contractors in New England. Its crews and equipment are scattered throughout Connecticut, some of them could be mobilized in any area within a short time. State civil defense officials say such pledges by construction firms help them plan how to meet possible emergencies on the basis of known amounts of manpower and equipment.

New Hiring Rules

Now that the closed shop is outlawed in the construction industry, how should a contractor adjust his hiring practices?

Here's a set of ground rules laid down by the National Labor Relations Board for the operation of a legal hiring hall. NLRB says:

- Selection of applicants shall be on a non-discriminatory basis and shall not be based on, or in any way affected by, union membership . . . or any other aspect or obligation of union membership, policies, or requirements.
- The employer must retain the right to reject any job applicant referred by the union.
- Whenever a hiring hall is maintained, both the union and the employer must post "all provisions relating to the functioning of the hiring arrangement," including an explicit statement that union membership is not a prerequisite.

Interstate Highway Work

The Bureau of Public Roads has defined in greater detail than ever before just how much and what kind of work is involved in construction of the Interstate System of Highways.

On the basis of reports from all 48 states and the District of Columbia, BPR says the network will total exactly 38,548 miles—33,980 miles of rural roads and 4,568 miles of urban roads.

The total cost will be $39.5 billion. Urban roads will cost $22.3 billion; rural roads, $17.2 billion.

Four-lane highways will make up 32,173 miles, or 83.5%, of the network. There will be 1,856 miles of two-lane roads, 3,251 miles of six-lane roads, 1,202 miles of eight-lane roads, and 66 miles of highways with 10 or more lanes.

Rural sections of the network alone will require 220 bridges more than 1,000 ft total length, 6,765 bridges less than 1,000 ft, 8,763 interchanges, 9,546 highway separations, 1,452 railroad separations, 405 highway-railroad separations, and 20 tunnels.

Contract Lottery

The Omaha District of the Corps of Engineers sponsored a lottery the other day. The prize was a $360,000 construction contract at Lincoln Air Force Base.

It was a perfectly legal sort of gambling. In fact, it was required by federal law. It was one of those rare cases in which two contractors submitted identical bids for a job. When everything else is equal, the law says the winner will be chosen by lot.

Natkin & Co. of Omaha and Lincoln, Neb., and the Ray Martin Co. of Lincoln agreed that Mrs. Ruth Grodt, a Corp of Engineers employee, should pick the winner's name out of a hat. The winner: Natkin.

Look and Learn

Sidewalk superintendents get lessons in construction techniques from Haas & Haynie, contractor for Crown Zellerbach Building in San Francisco.

The contractor posts a king-size photo of the job plus a progress report explaining the work under way in front of bleachers at the site.

1.

A healthy turnpike contract caught the eye of builder Sid;
He fine-tooth-combed the specs and promptly added up his bid.
Alas, his efforts laid an egg—his bid bond came too late.
No bond, no bid, no job for Sid: he missed the closing date.

2.

Sid hit the ceiling—raised the roof—grew crimson, furious.
He buttonholed the man who won and moaned, "I'm curious.
How come slow service on my bond derailed my well-laid plan?"
"My secret's simple," said the winner. "Call a Travelers man.

3.

"The Travelers sends an *expert*—not some ordinary Joe.
He sells *the* bond for every job and doesn't waste your dough
On fancy frills and furbelows that you will never need.
But even more important—Travelers bonds arrive with *speed*."

4.

"I'm sold already," Sid replied. "There's reason in your rhyme.
Just watch me go now that I know my bonds will be on time."
You needn't let a snail-like bond knock all your plans askew.
A Travelers bond's not only right, but it's the quickest, too.

NOTE: Comp, Equipment Floaters—Builders' Risk Insurance, too
Are other ways The Travelers helps a contractor like you.

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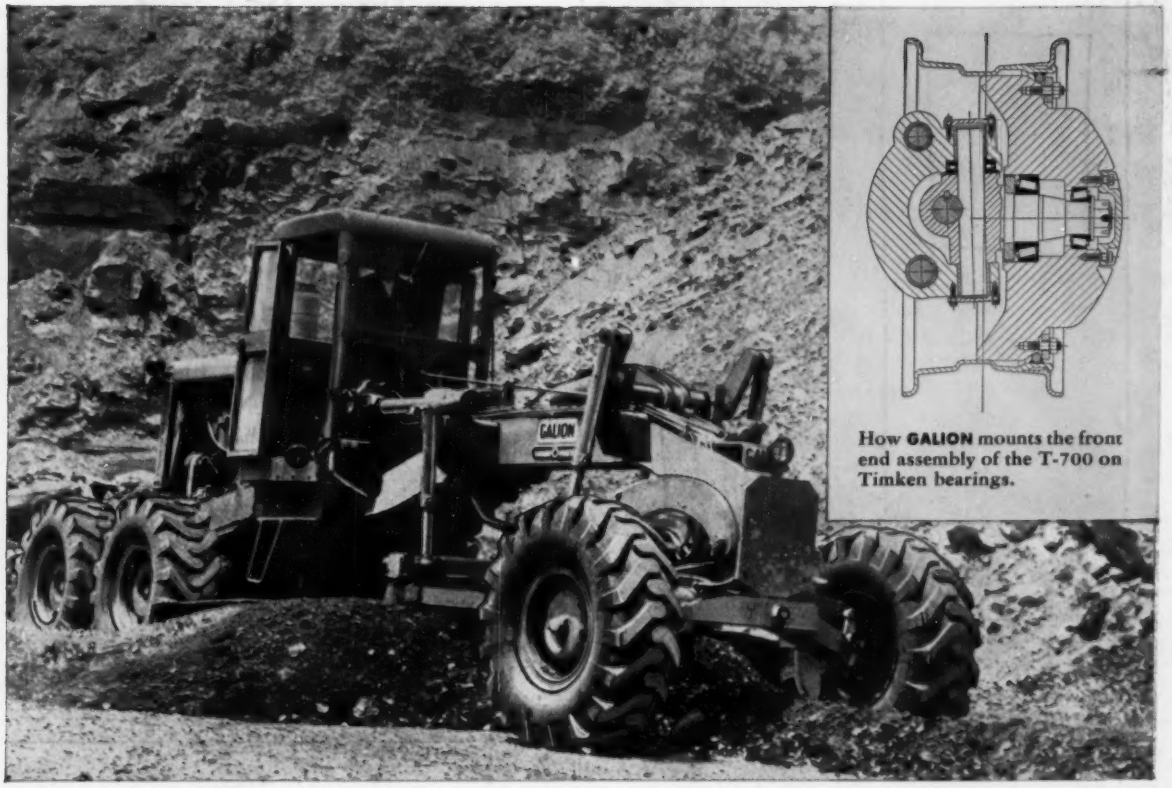

How **GALION** mounts the front end assembly of the T-700 on Timken bearings.

World's largest motor grader weighs more than 20 tons—24 TIMKEN® bearings take the load

THE world's largest motor grader (above) sets up enormous loads as it slams a road into shape. And when it rolls on a steep grade, the thrust loads are even greater. To make sure their T-700 Grade-O-Matic could take *all* the loads, the Galion Iron Works & Manufacturing Company specified 24 Timken® tapered roller bearings—for the reverse gear case, transfer case, front wheels and king pins, and the rear wheel tandem drive.

The tapered construction of tapered roller bearings lets them take all combinations of loads—thrust as well as radial. And because they're case-carburized to produce hard, wear-resistant surfaces over tough, shock-resistant cores, Timken bearings take the shock loads of heavy construction work. And full line contact between rollers and races gives them extra load carrying capacity to stand up to the job day after day, season after season.

Timken bearings are geometrically designed to provide true rolling motion—precision manufactured to live up to their design. They practically eliminate friction. And by holding shafts concentric with their housings, they make closures more effective—keep lubricant in, dirt out.

And to make sure we control the quality of Timken bearings all the way down the line, we even make our own steel—an extra step no other American bearing manufacturer takes.

Make sure you get all these advantages in the machines you buy or build. Specify Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN

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TAPERED ROLLER BEARINGS ROLL THE LOAD